A L Maclaw

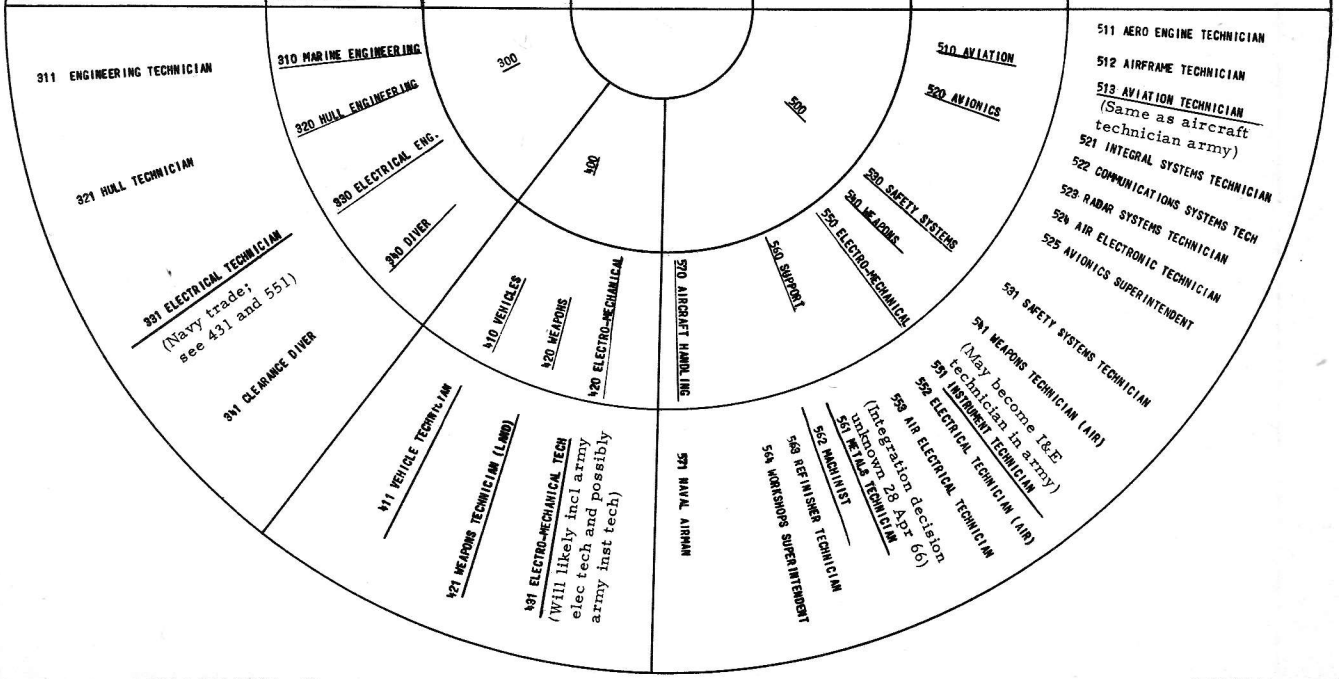
RCEME TECHNICAL BULLETIN

TRADE	CAREER FIELD	OCCUPATIONAL CODE
011 CREWMAN 012 CREWMAN RECONNAISSANCE 013 CREW COMMANDER	010 ARMOUR	
021 ARTILLERYMAN 022 ARTILLERY TECHNICIAN 023 ARTILLERY SURVEYOR 024 ARTILLERY LOCATOR 025 CHIEF ARTILLERYMAN 026 CHIEF LOCATOR 027 MASTER GUNNER	020 ARTILLERY	
031 INFANTRYMAN	030 INFANTRY	000
041 FIELD ENGINEER	040 FIELD ENGINEERING	
051 DRIVER SIGNALS 052 LINEMAN 058 LINE CONSTRUCTION FOREMAN	050 SIGNALS	
061 WEAPONMAN SURFACE 062 WEAPONMAN UNDERWATER	060 SEA	
071 FIRECONTROLMAN	070 WEAPONS	
081 NAVAL AIRCREWMAN	080 MARITIME/AIR	
091 FLIGHT ENGINEER	090 AIR	
111 INTELLIGENCE OPERATOR	110 INTELLIGENCE	
121 METEOROLOGICAL TECHNICIAN	120 WEATHER	
131 PHOTOGRAPHIC TECHNICIAN	130 PHOTOGRAPHY	
141 TOPOGRAPHICAL SURVEYOR	140 TOPOGRAPHY	100
151 CARTOGRAPHER	150 CARTOGRAPHY	
161 AIR TRAFFIC CONTROL ASSISTANT	160 AIR TRAFFIC CONTROL	
171 FIGHTER CONTROL OPERATOR	170 AIR FIGHTER CONTROL	
181 BOATSWAIN	180 BOATSWAIN	
211 RADIO OPERATOR 212 TELETYPE OPERATOR 213 RADIO & TELETYPE SUPERVISOR	210 COMMUNICATIONS OPERATION	
221 RADIO TECHNICIAN 222 TERMINAL EQUIPMENT TECHNICIAN 223 TELETYPE & CYPHER TECHNICIAN 224 COMMUNICATIONS SUPERINTENDENT	220 COMMUNICATIONS MAINTENANCE	200
231 RADAR TECHNICIAN	230 RADAR MAINTENANCE	
241 ELECTRONIC TECHNICIAN (SEA)	240 ELECTRONIC (SEA)	
251 RADIOMAN (SEA)	250 RADIO (SEA)	
261 SIGNALMAN (SEA)	260 SIGNALS (SEA)	
271 RADAR PLOTTER (SEA)	270 RADAR (SEA)	
281 SONARMAN	280 SONAR (SEA)	
291 COMMUNICATOR RESEARCH	290 RESEARCH	

CANADIAN FORCES MILITARY OCCUPATIONS

RCEME trades have been underlined as an aid to identification and qualifying remarks have been added where necessary for clarification.

OCCUPATIONAL CODE	CAREER FIELD	TRADE
900	910 SUPPLY	911 SUPPLY TECHNICIAN 912 PARACHUTE RIGGER
	920 AMMUNITION	921 AMMUNITION TECHNICIAN
	930 TRANSPORTATION	931 TRANSPORT OPERATOR 932 OPERATOR ENGINEERING EQUIP 933 934 TRANSPORTATION SUPER
800	810 SECURITY	811 MILITARY POLICEMAN 812 SPECIAL INVESTIGATOR 813 DISCIPLINARIAN 814 MILITARY INSTRUCTOR
	820 DATA PROCESSING	821 DATA PROCESSOR
	830 CLERICAL	831 ADMINISTRATIVE CLERK 832 STENOGRAPHER 833 COURT REPORTER
	840 ACCOUNTING	841 FINANCE CLERK
	850 PHYSICAL AND RECREATION	851 PHYSICAL EDUCATION AND RECREATION INSTRUCTOR
	860 FOOD SERVICES	861 COOK 862 STEWARD
	870 MUSIC	871 MUSICIAN 872 PIPER
	880 POSTAL	881 POSTAL CLERK
	890 GRAPHICS	891 GRAPHIC ARTISTS 892 DRAUGHTSMAN
700	710 MEDICAL	711 MEDICAL ASSISTANT 712 NURSING ASSISTANT 713 OPERATING ROOM ASSISTANT 714 LABORATORY TECHNICIAN 715 XRAY TECHNICIAN 716 HYGIENE TECHNICIAN 717 BIOSCIENCE TECHNICIAN
	720 DENTAL	721 DENTAL ASSISTANT 722 DENTAL CLINICAL 723 DENTAL LABORATORY 724 DENTAL EQUIPMENT MAINTENANCE
600	610 STRUCTURES	611 CONSTRUCTION ENGINEERING TECH 612 STRUCTURE TECHNICIAN 613 PLUMBER GAS FITTER 614 ELECTRICIAN 615 STRUCTURES SUPERINTENDENT
	620 MECHANICAL	621 REFRIGERATION AND MECHANICAL TECH 622 ELECTRICAL GENERATING SYSTEM TECH 623 STATIONERY ENGINEER 624 POL WATER AND SANITATION TECH 625 MECHANICAL SYSTEMS SUPER
	650 FIRE PREVENTION	651 FIRE FIGHTER



VOLUME II, NUMBER 2 APRIL 1966

RCEME TECHNICAL BULLETIN

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COVER: Chart showing tentative regrouping of triservice trades into career fields. See also page 8

This Technical Bulletin is issued under the authority of Colonel KR Ward, CD, Director Land Materiel Maintenance, MATCOM. The contents have been approved for publication by Lieut Colonel JP Sherren, CD.

The Bulletin is published to assist RCEME personnel in keeping abreast of current trends in developments, to amplify or emphasize technical instructions, to circulate news of Corps and individual activities, and to provide a forum for discussion and the exchange of ideas by members of the Corps. The information and statements herein do not necessarily represent official policy and are not to be quoted as authority for action.

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WE ARE STILL LOOKING FOR WRITERS

Since July 1964 -- eight issues of this Technical Bulletin — only 36 RCEME people have contributed in other than a very minor way towards its success. Fortunately some of these writers have appeared in print several times, or the Bulletin might have had an untimely (and quite unnecessary) demise. (See page 27)

You must admit it's almost incredible that out of a total strength of 4000 officers and men only a handful have found the time to write even 500 words for their own paper.

Surely it's not because you have no use for it, or don't believe it serves a useful purpose. A survey made a year ago proves otherwise; our percentage of returns was high and most replies showed interest. Many readers demanded more Corps' news but they have since made no attempt to supply any.

But what can we say! Nothing, certainly, that hasn't been said before; in fact many times in the past few years.

For instance, we've told you that the ability to write good technical articles is a great asset to a technician; we've told you that readable technical writers are in demand; and we've told you that writing helps to clarify your thinking on most subjects.

In addition we've provided an open market for your writing and promised you a thrill when you saw your name in print. Your Director offered a prize for the best essay on a subject relevant to RCEME.

And what happened? Practically nothing. Was there a flood of manuscripts? Well, hardly! The old reliable few kept up their steady pace and that was about it.

Where do we go from here?

With the breaking up of the familiar Corps channels and associations, the Technical Bulletin is probably more needed than it ever was, to 'keep in touch'. We must devise ways and means to get action from our readers, the members of our Corps.

So we appeal once again for writers.

Here's one suggestion. The School has devised this system which might be followed in every RCEME company and workshop. Each company and section in the School have been scheduled in turn to write on some subject for every issue of the Bulletin.

Don't wait for volunteers — lay it on!

SENIOR OFFICERS ATTENDING STUDY PERIOD
RCEME SCHOOL, 26 to 28 JAN, 1966

Front row:	Col GW Thompson	Third row:	Lt Col RHC Hodgson
	Col AL Maclean		Lt Col EG Jones
	Col KR Ward		Lt Col BB Cox
	Col A Mendelsohn		Lt Col RC Rivers
	Col AHR Lewis		Lt Col ANP Roberts
Second row:	Lt Col GG Cavaghan		Lt Col WH Glover
	Lt Col CG Provan		Lt Col DA Campbell
	Lt Col AM Reid	Back row:	Lt Col CG Lawrence
	Lt Col HM Robinson		Lt Col ALD MacDonell
	Lt Col GW Bruce		Lt Col EC Ilott
	Lt Col AGM Maitland		Major JC Boughton
	Lt Col DG Carlyle		Major JA Richards
	Lt Col VW Bethel		Lt Col DJ Tidy
	Lt Col FG Johnson		Lt Col KF Collins

R.C.E.M.E. IN THE CENTENNIAL

By Major WH Norton, CD

When DEME representatives visited the Ottawa DND Centennial Headquarters for briefing on plans for the Armed Forces Tattoo, we were very much impressed, to say the least. Without disclosing the highlights of the display, we can say that RCEME and RC Sigs personnel will provide about 10 minutes of a 2-hour show.

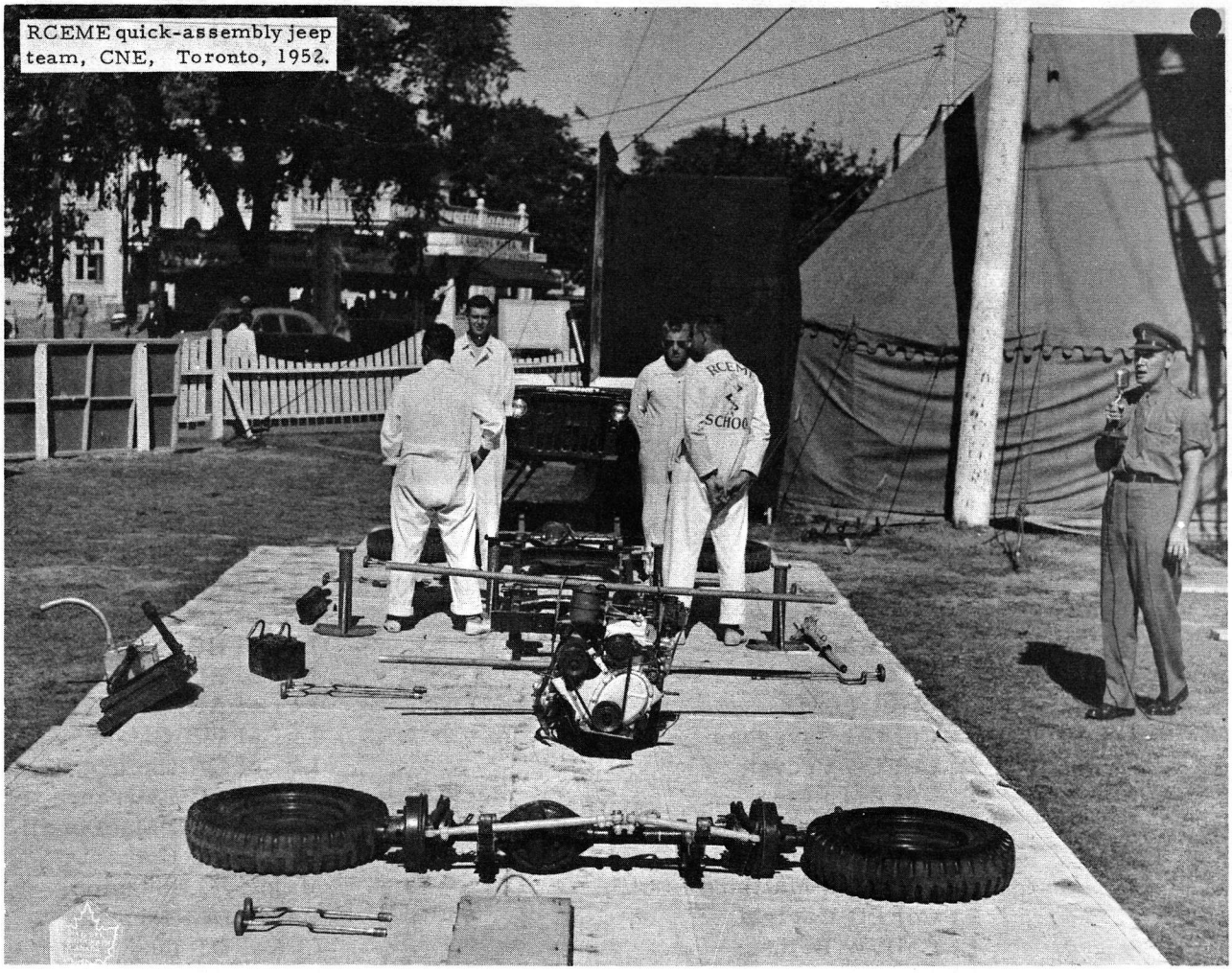
About 50 members of our Corps will be involved for 10 months to a year in 1967.

The Military Tattoo will travel across Canada in two trains, with RCEME having two teams on each train. The itinerary calls for the presentation of the show at important locations in Canada, including Expo 67 and the Canadian National Exhibition in Toronto. A tour of some American cities is being considered.

The RCEME teams will be stripping and assembling jeeps — but I hasten to point out that a very glamorous Hollywood-type production is planned. DEME is arranging for the preparation of four quick-assembly jeeps.

The Commandant of the RCEME School has been given the job of assembling and training the personnel for this show. When the time comes to get the teams together, the Corps will be looking for 50 single, strong (lifted any jeep engines lately?) red-blooded RCEME types who aspire to a little ham acting, and are willing to live out of a suitcase for several months. Any volunteers?

Former quick-assembly jeep team members (see below for some) are invited to forward suggestions to the DEME Unit Tattoo Officer, Major WH Norton, who is 'in the picture'.



RCEME quick-assembly jeep team, CNE, Toronto, 1952.

Service officers are not necessarily SQUARE

By Peter Johnson

(Thoughts provoked by "Square Pegs for Square Holes" in the Jan 66 Technical Bulletin.)

It has been contended that the service officer is better suited than the arms officer to the square hole of a logistics staff appointment, (with the inference that this is the only staff appointment to which he is suited), and that the state of military logistics would improve if this was acknowledged by the army as a fact.

The argument in favour of these contentions depends mainly upon the premise that there exist important fundamental differences between arms and service officers with respect to their training, experience, and general knowledge of logistics.

DIFFERENCES BETWEEN ARMS AND SERVICE OFFICERS

According to the article, "Square Pegs for Square Holes", the two types of officer receive virtually the same training in tactics, strategy and logistics rituals, write the same promotion examinations, attend the same Staff College courses. I quote, "His (the service officer's) training appears to be designed to make him a "G" staff officer." Also, "His initial experience with logistics is very similar to the arms officer, except he will have participated in the operation of a logistics unit. He probably has a good idea of how the other logistics services operate, because of their usual proximity to each other... If he is able to break the bonds of his ritualistic logistics training, he has a chance of approaching (Admiral Eccles") ideal logistics staff officer."

From this it would appear that the main differences between arms and service officers are a matter of propinquity to logistics units and, presumably, an initial interest in some aspect of the logistics field.

These differences seem hardly sufficient to justify the assertion that service officers are best qualified to fill logistics staff positions, nor do they justify the statement that, "...all operations staff positions are understandably (sic) closed to the service officer." In fact, none of the statements made in the article explain why one type of officer should be considered any better qualified than the other to fill any staff appointment - except for the traditional division of the army into arms and service branches.

DIVISION OF THE ARMY INTO ARMS AND SERVICE BRANCHES

A tenable argument can be put forward that this division is a purely arbitrary one in a modern army - a tradition - based more on Clausewitz's distinction between the use and the maintenance of armed forces than on the practical realities of modern warfare.

At the time Clausewitz wrote, it was possible to divide the actual combat activities, ie, marches, camps, and quarters, from the maintenance activities such as supply and the replacement and repair of arms and equipment. While routes of march and the location of camps and quarters could directly affect the outcome of a single engagement, it could be said with truth that, "The feeding of troops will verify the plan of an engagement...", and, "... the replacing and repairing of arms and equipment takes place only periodically and therefore seldom affects strategic plans."

The division was indeed practical in those days. Of the twenty-one battles fought during the Peninsular War, none lasted more than a day. The Battle of the Plains of Abraham lasted less than a day. Even during the Crimean War, of the three battles fought between the landing in mid-September, and mid-November, none lasted more than a few hours. In each of these engagements, a decision was reached using the resources available on the field before the battle began. They did not last long enough for maintenance activities during the battle to directly affect the outcome.

The short duration of these battles, typical of pre-twentieth century wars, is in striking contrast to the major battles of the two world wars; El Alamein, for instance, lasted eleven days! It is immediately obvious that the outcome of such long modern engagements can be vitally affected by the logistic activities being

carried on in the field concurrently with the combat activities. In other words, logistic operations have now become an integral part of the battle itself, and this complication of the art of war can only be intensified by further developments in weapons and tactics.*

Under the conditions of modern warfare, therefore, it can be reasonably argued that the division of the army, at the operational level, into arms and service branches on the basis of the military theory and practice of a bygone age is outdated and should be abandoned.

ARMY CAREER PROSPECTS FOR GRADUATE ENGINEERS.

From another point of view, consider the effect this division has on the career prospects of a graduate engineer who thinks of joining the army.

An electronics engineer, for instance, can join RC Sigs or RCEME and still work, theoretically speaking, within his field of primary interest and training. If he joins RC Sigs he will be an arms officer, and as such he can aspire to any staff appointment, even that of Chief of the Defence Staff. If he joins RCEME, however, he will be a service officer, and even under the terms of Captain Campbell's article he must content himself with humbler aspirations: a logistics staff position must be the summit of his ambition. Precisely the same situation faces the engineer who can choose between the RCE and a service corps.

It might be argued that the service officer, particularly the RCEME officer, has a greater opportunity to utilize his professional training than the arms officer, and that this will compensate for the lack of military opportunity. But Captain Campbell himself says, "It is unlikely that a young, staff-trained service officer has got himself into the rut of a technical speciality, because he will not have spent that much time employed in his speciality." (my italics).

These facts are likely to dampen the enthusiasm of many energetic and ambitious engineering candidates for RCEME commissions. Yet it would not be so if the following changes were incorporated into army policy:

a. Elimination of the anachronistic differentiation between arms and service officers.
b. Payment of 'professional pay' to engineers employed primarily in engineering positions, similar to the allowances paid to doctors and dentists.

These changes would encourage some engineers to pass through RCEME on their way to senior staff positions, others to specialize in thrir chosen field within the Corps. For those whth no such ambition, the degree would still serve, as it does at present, as a certificate that at an early age the possessor has shown that he has, or is likely to develop, the qualities desirable in a RCEME officer: a good general intelligence, a technical background, and an intimate knowledge and understanding of the capacities and limitations of RCEME tradesmen and facilities.

It could be objected that, with two such challenging path of opportunity open to them, few engineers would be interested in the ordinary, everyday, RCEME officer's task. This is a possibility. But, if I may disgress for a moment...

THE COMMISSIONING OF RCEME OFFICERS

...Possession of the qualities referred to is not restricted exclusively to engineers. These qualities are also possessed by many 'other ranks' in the Corps. In particular, many qualified group 4 tradesmen have shown during their service that they possess them. And some, after ten years of striving, have reached a point in their carrers where there is little incentive to further effort. When they are still full of energy and ambition.

If suitably qualified members of this group were commissioned at the point in their carrers when they are about 30, instead of 40 as at present, their energy and ambition could still be harnessed for the good of the Corps and the army, instead of being wasted, frittered away through long years in the same rank. They would still have the time and enthusiasm to work, study, write promotion examinations, and possibly rise through the commissioned ranks to senior positions within the Corps. In other words, the incentive for them to continue to work hard would still be there, and the Corps would benefir from their experience before they have become hide-bound by it.

---

* Consider the logistics implications of Captain F J Norman's article in the final issue of the Canadian Army Journal.) (Vol XIX No 2 p 78.

At present the graduate engineer who is persuaded to join RCEME is, in many cases, being sold 'a bill of goods'. He has little chance of doing any engineering and, as a service officer, the path to the top of the military profession is closed.

At present too, the young, energetic, master technician with up to twenty years service ahead of him is, in many cases, at a career standstill with little to strive for since his future depends primarily upon the slow movement of the seniority list.

The changes suggested here, in the concept of arms and service branches of the army, in the payment of a professional allowance for engineers, and in the commissioning policy would, I believe, prove of inestimable value to the Corps and the army. The energy and enthusiasm of many master technicians would be utilized where it is now largely wasted. Young graduate engineers would have a greater incentive to join the Corps, and stay in the Corps, whether for military or professional reasons. And ultimately, to return to Captain Campbell's theme, the Corps and the army would benefit by having RCEME personnel in senior staff appointments.

The staff officer is, after all, the alter ego of the commander. It is the function of the staff officer to extend the range of experience and the range of control of the commander beyond the limits of one man's capacity, at the same time always reflecting the personality and operating methods of the commander.

Because of his training, his background, his knowledge of the logistics field, the officer who comes to the staff from a service corps such as RCEME can make an essential contribution to the staff in any appointment. In this respect I disagree with Captain Campbell only inasmuch as I thind he has set his sights too low.

Staff-trained service officers are not necessarily square.

Ssgt ET Goodman, DEME, is shown receiving a Suggestion Award and cheque from Col KR Ward. Ssgt Goodman's suggestion for an increased interval between oil and oil-filter changes in recovery vehicles has been adopted by the Services.

History on the Wall

The three portraits of past Directors are (right to left):

Col HG Thompson DFC
COME '41, DME '44

Col RL Franklin
D of MM '44, DME '45

Col JW Bishop
DME 1945 - 1948

The Integration Of R.C.E.M.E. Trades

At this point in time there must be a large number of our Corps tradesmen who are shaking their heads in bewilderment trying to guess what the future holds for technicians who will eventually find themselves working in reorganized integrated trades.

As the dust of reorganization begins to settle in some trade areas a clearer picture of the proposed new trade organization emerges, and it is hoped that this writing will help to show the current situation.

When integration of all trades was first considered as a result of the Government White Paper, CFHQ was directed to carry out a study to determine which trades were allied closely enough to warrant integration. Cursory results of this study indicated that of 248 existing trades in the three services, approximately 120 are all that will be required when the new unified force comes into being.

The chart shown on our cover, is a proposed tentative regrouping of triservice trades into suggested career fields. RCEME trades have been underlined as an aid to identification.

You may well wonder what all this is going to do for RCEME tradesmen. Before considering the advantages, an understanding of the aim of an integrated trade structure will help to clarify proposed plans for the future.

The Canadian Forces Trade Structure in its final form will provide the framework within which personnel can be recruited, selected, trained, promoted, rotated and paid.

Unlike civilian employment which permits an employer and an employee to accept a job at a given location, military employment must allow for the rapid posting of trained personnel to tasks that must be performed in many places in the world. To find people willing to work as military tradesmen accepting the demands of the service, it follows that the Forces must offer a career with equitable pay. This is the aim of the integrated trade structure.

To assist you in understanding trade integration plans certain terms are now commonly used in these considerations and four of the most important terms are defined below.

Career Field is a cluster of related trades in which, when it is absolutely necessary, posting or assignment from one trade to another within the career field will be possible to meet unforeseen and urgent needs. Promotion at the Group 4 level will be competitive within the career field.

Trades are grouped in career fields and could include up to 200 specialties within a trade.

Specialties are incorporated in a trade and will be the basis on which personnel are selected for postings and courses. For example, a number of Vehicle Mechanics might be chosen to attend courses on a particular vehicle or piece of equipment in use in the service in small quantities. By this method only the number of tradesmen required to maintain the equipment would receive the training. The obvious advantage would be the savings gained through limited training costs. This specialized training would then be an important factor in the tradesman's selection for posting.

Occupational Code is a career field or group of career fields related by functions.

Considerable work has already been carried out in all trade areas and as of 16 March 1966 the situation with regard to the integration of RCEME trades is shown on the chart.

Specifically we are all curious to know if the integration of trades will eventually prove to be a good or bad thing for tradesmen.

The proposed career field concept of grouping a number of related trades promises to do more for tradesmen than anything tried in the past. All technical trades under the integrated system will allow trades progression to the top trades grouping which was not the case in the past. This means then that trades such as Machinist and Metals Technician which in the past were dead-end trades at the Group 3 Corporal level will, in the new system, make it possible for tradesmen to progress to the Group 4 level.

Trades pay rates are currently under active consideration and a new system of rates will be introduced.

It is also common knowledge as announced in the press that new pay rates are planned for October 1966.

One of the interesting considerations of a future unified service will be the ability of certain tradesmen to perform their duties in environments which in the past were barred to them because of the independant operation of

(Continued on page 9)

WORKSHOP ACCOUNTING PROCEDURES

Progressive organizations that have recognized the usefulness of scientific management principles have developed standards of production and have established control techniques to ensure compliance with these standards. The concept of the professional manager running a business by instinct rather than by plans based on timely and accurate information is outmoded. Organizations fail to meet their responsibilities primarily because of poor management.

Effective management procedures include a self-regulating or "feedback" principle of planning, performing and inspection. Goals are planned, plans are implemented, results are inspected and measured against expectations; plans are revised according to whatever corrective measures seem to be required.

The "feedback" principle should be applied by RCEME officers to all management activities. Any manager can improve his operation by utilizing simple and properly selected control data as a basis for decision making. It is obvious that any informed decision based on objective as well as subjective reasoning is bound to produce better results. Objective information allows the manager to take effective control action to control future events. It must be remembered, however, it is not the "feedback" data that controls; management action does.

Workshop Accounting Procedures have been developed and will be improved regularly to provide workshop officers and their superiors with the "feedback" required for better management. The procedures provide a method for controlling the status of each job in progress, a method of accounting for technical manpower employment. The two accounting procedures permit measurement of performance against expectations. These are the "feedback" tools of RCEME management.

These procedures are being used in varying degrees in various types of RCEME installations. Static workshops performing field and base repairs and many RCEME installations performing unit repairs are now using the complete workshop accounting procedure. Field workshops, however, have been permitted two major deviations which reduce considerably the usefulness of the information provided. First, they are not required to summarize manpower employment data. There is, therefore, no means of measuring the workshop's capacity or effectiveness. Secondly, field workshops are not required during exercises to account for any technical activity other than repairs, although the labour for these technical activities represents about 35% of the labour required for repairs.

Training for war requires a managed ability to meet repair and maintenance commitments. Statistical analysis of workshop capacity and effectiveness combined with other information such as the portion of work backloaded or re-allocated could indicate whether or not field establishments are adequate. A statistical cost study of the total repair effort related to major equipment is needed also to validate existing establishments and to design new establishments.

It is anticipated that the application of scientific management principles and procedures will be encouraged, in all echelons of EME activity in all types of units and that basic standard procedures will be applied to all units. Implementation of this policy will begin by requiring field workshops and the EBS Battalion to comply with all aspects of EME Manual Management K010 on a year-round basis. Subsequently, we can expect action to apply these procedures to all technical repair installations employing RCEME tradesmen including workshop platoons of RCASC Transport Companies and unit repair elements of other units.

INTEGRATION OF TRADES (continued)

the three services. Let's face it, a Vehicle Mechanic is not concerned whether or not the equipment he repairs is used by personnel on an aerodrome, on a ship or in a land environment. This statement is not all-embracing for there are trades which are still peculiar to a particular environment. For example, it is not likely that land based units could employ to advantage a Naval Clearance Diver.

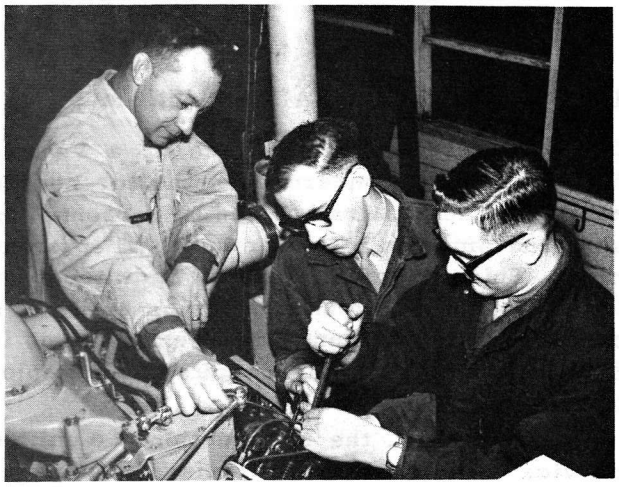
In summary, the introduction of a unified service trade structure promises advantages in career progression and, we hope, in pay. These have been denied to certain tradesmen in the past. Although reorganization is always confusing, hang on, the future is brighter for tradesmen than many think it is.

M113A1 TRAINING

By Ssgt GJ Turcotte, RCEME School

In an article in the January 1965 issue of the RCEME Technical Bulletin, WO1 RH Stewart described the preparation being made to train RCEME mechanics at the RCEME School in the maintenance of the M113A1 armoured personnel carriers. He also outlined the progress which had been made to that date. As a matter of interest some changes have occurred since then. WO1 Stewart retired, S/Sgt Curran was promoted and posted, and the civilian instructors returned to sunny California. Of the original group only S/Sgts Funk, Hein and myself remain. In place of those who have left, the platoon is now commanded by Capt Charles, whilst nine assistant instructors have been added to the staff.

In the way of equipment, we now have six complete carriers with which to work. Stripping assemblies and components on which students may polish their repair and rebuilding techniques are still in very short supply. Partly to relieve this shortage it was found necessary to strip one of the running carriers of its components temporarily, pending the arrival of the rest of the training package. This has left the wing only five running vehicles on which to operate. However, two more machines are expected to arrive at any moment and when these, and the rest of the training package of stripping assemblies arrive, we hope that building A7 will look less like the empty barn which it now resembles.



Sgt LA Maude, Lt TW Strang and Lt NE Pothier carry out rack adjustment on 6V53 diesel engine

In the meantime, despite handicaps and inconveniences, we feel that considerable progress has been made. Classes are constantly coming and going, with as many as seven in progress at any one time. Up to the end of Nov 65 the school has graduated one Warrant Officer Class 1, eleven Warrant Officers Class 2, thirty-five S/Sgts, seventy-three Sergeants, ninety-seven Corporals, ten L/Cpls, fifty-nine Craftsmen and four civilians from the four and five week maintenance courses. Besides these, seventy-seven, Gp 1 Craftsmen attended a three week course on the carrier as part of their regular vehicle mechanic (wheeled) training, and three more courses, including a special French speaking one, are in progress. In addition, at the time of writing, (December 65) there are in progress a five week Gp III vehicle mechanic course, and a special Subalterns EME Orientation course of one week's duration for thirty officers.

I mentioned above four and five week maintenance courses and perhaps some explanation on this point is necessary. It may be recalled that WO1 Stewart made mention of a six week maintenance course in his article. With additional experience and study it was found that we could still achieve the aim of the maintenance courses with shortened courses of four and five week's duration. The difference in the time element occurs because it is necessary to teach diesel principles and the particular engine under study to Group III vehicle mechanics (wheeled) who have had no prior training in this subject. This additional instruction is, of course, unnecessary in the case of tracked Group III mechanics and Group IV technicians.

Both courses aim to teach mechanics and technicians how to operate, service, inspect and carry out unit and field repairs. With this in mind, the courses cover an introduction to the vehicle, describe the components, explain the operation of the vehicle and its components and practise students in repair procedures and

trouble shooting within the prescribed limits. Using the four week syllabus as an example, the following sequence has been adopted - one week on driver responsibilities including starting, stopping, driving, lubrication and driver maintenance; two weeks on field repairs of the engine and power train, including assembly removal and installation; and the final week on hull components, suspension and trouble shooting. This may seem a little crowded, however classes are restricted to twelve students, and with two instructors per class, the subject is easily covered in the time allotted.

From time to time various classes criticize certain phases of the course. Such criticism usually centers around a desire for more trouble shooting, road testing, unit inspection and occasionally for more extensive repair information on certain major assemblies such as the transmission and engine. In this connection, it must be remembered that the course is limited to unit and field repairs as prescribed in the PRS. We agree that in courses of this nature it is desirable to emphasize the practical aspects but there are problems connected with availability of equipment. Because of the shortage of training aids and vehicles, we are obliged to continue the course in its present form. When the deficiency is made good, we propose to take a critical look at the course content and recommend a change of emphasis towards more practical training.

In conclusion it is suggested that much practical training can be undertaken at unit level thus ensuring that experience is handed down in those units where most experience is gained.

Lt JJ Fyfe and Lt RJ Ferguson probe into the depths of the engine compartment

37th TECHNICAL SQUADRON (MILITIA)

Lsgt LO Lidgett was the first winner of the Balcaen Cup presented on parade 10 Dec 1965 for the training year 1964-65.

The Balcaen Cup is to be presented annually for general proficiency to an individual below the rank of sergeant. It is presented in honour and remembrance of Major AJ Balcaen CD former Commanding Officer of 37 Tech Sqn, RCEME, Saskatoon. Major Balcaen was CO from September 1960 until the time of his death in October 1964.

Mrs Balcaen, widow of the former CO, presented the Cup on parade at which the Inspecting Officer was Lt Col PD Carne CD, Commanding Officer, Regina Service Battalion of which 37 Tech Sqn is a part.

The picture, taken during the social evening after parade, shows Mrs Balcaen, Major JJ McCartan, present OC, and Lsgt Lidgett, holding his cup.

Maintenance Management Information System

Management in the past depended heavily on experience and hunches to determine a best course of action. Frequently educated guesses had to be made from a mass of unco-ordinated information or from very little information. During the early 1950s management realized that more information was required to assist in making management decisions and in 1954 the present RCEME control and accounting procedures were introduced. These procedures are published in EME Manual Management K 010 and General H 041 and except for amendments to clarify and to apply the data to an automatic data processing facility, the procedures remain substantially unchanged. The existing manuals describe the procedures for;

a. Requesting EME services and controlling the accounting of equipment between units and a RCEME workshop.

b. Scheduling work into a workshop and controlling the progress of each job.

c. Obtaining spare parts and material.

d. Reporting workshop loading and work completed.

e. Reporting manpower availability and employment.

Management information is presently obtained by summarizing the activities in RCEME workshops by an automatic data processing system to produce Workshop Activity Summaries of labour manhours and parts cost by type of equipment repaired or by activity performed. Repair Cost Histories for registered numbered equipment are also produced automatically to provide annual and cumulative repair costs, number of engines and transmissions replaced and the milage of each for approximately 20,000 pieces of equipment. Technical manpower employment data is recorded manually by workshops for analysis by workshop commanders and higher management. The summaries produced by automatic data processing are distributed to workshops for use by workshop managers and are used to a certain extent by DEME.

Though a considerable amount of useful information has been collected, the system in its present state of development is too circumscribed by proneness to error, susceptability to misinterpretation and limitations in coverage to be a really effective management tool. It is not proposed that the present system should be discarded and a completely new one introduced, rather we should build from the same base to improve the situation. Collection methods need to be improved and much more data needs to be collected in order to provide a more substantial raw data base to which sophisticated analysis techniques can be applied to produce timely, useful information in a usable form for all management levels. In short, a comprehensive management information system needs to be developed for effective execution of the maintenance function.

To develop such an information system will require a systems analysis study, using scientific methods and conducted by competent individuals, to define the parameters, outline its characteristics and design its details. The system should include the following features:

a. A simple method of collecting all potentially useful data in its most basic form with only essential tie-in points, and without attempting to select only that information for which there is a known and immediate use.

b. The method of recording should be mechanized as much as possible to reduce the collecting effort and to reduce the probability of error.

c. The system should provide for an automatic management audit which would maintain the validity of input and output information by ensuring that instructions have been correctly interpreted and implemented and also to provide a basis for continuing analysis which would ensure the system's viability.

d. A means of feeding the collected data into the processing facility as soon as possible after it is collected in order that the analysis and feedback can be available to managers in time to be useful.

e. Determination of the information needed for decision-making and planning at all levels of maintenance management and the design of programs to analyse and portray the information in its simplest usable form.

f. The information system should be designed to facilitate the use of procedures at all

levels of maintenance management which will effectively execute all activities of management including particularly controlling, co-ordinating and planning. As a minimum requirement the revised system should provide the following information;

a. The degree to which direct labour is meeting standard repair times.

b. The cost of various maintenance operations per mile of operation or on some other meaningful base.

c. The labour and material cost per year to maintain specific equipment in service or in storage.

d. The operational readiness conditions of equipment, by equipment, by formation or against any other meaningful base.

e. The degree to which each equipment or group of equipment is unavailable to the user by virtue of the fact that it is undergoing servicing, maintenance or repair, in comparison to the standard times for performance of the activities.

f. Actual parts usage information to validate scales for national stocks, local spare parts holdings and to amend scaling practices, compared to predictions on a time base.

g. Life expectancies of equipment, assemblies, components, compared to predictions

h. Failure patterns.

i. The modification state of equipment.

j. Technical analysis data to guide the formation of maintenance policies, procedures and techniques.

k. Cost analysis of all aspects of maintenance.

l. Trend patterns in all management information which will lend themselves to simple graphical plotting for visual displays.

m. Analysis should also attempt to relate the trends of various factors, even though relationships are not obvious, to provide a means of predicting the magnitude and direction of probable changes which will occur if existing conditions continue. This same facility should also enable operational research methods to be applied to predicting the probable results of proposed changes to policy, procedure and techniques.

n. The data processing aspects should be designed with tie-in interfaces to other branches of a total logistics information system.

Continuous studies, separate from the maintenance execution function, are also required to relate cost analysis, repair standards, standard repair times and repair techniques in order to;

a. Validate or develop life expectancies of major and minor assemblies so that servicing, maintenance and repairs can be scheduled on a sound engineering basis with full cognizance of the cost effectiveness.

b. Relate particular techniques and technical repair standards to cost and life expectancy.

c. Relay high incidence of limited life and high cost of repair items in order to distinguish areas in which effort for product improvement could be expended most advantageously.

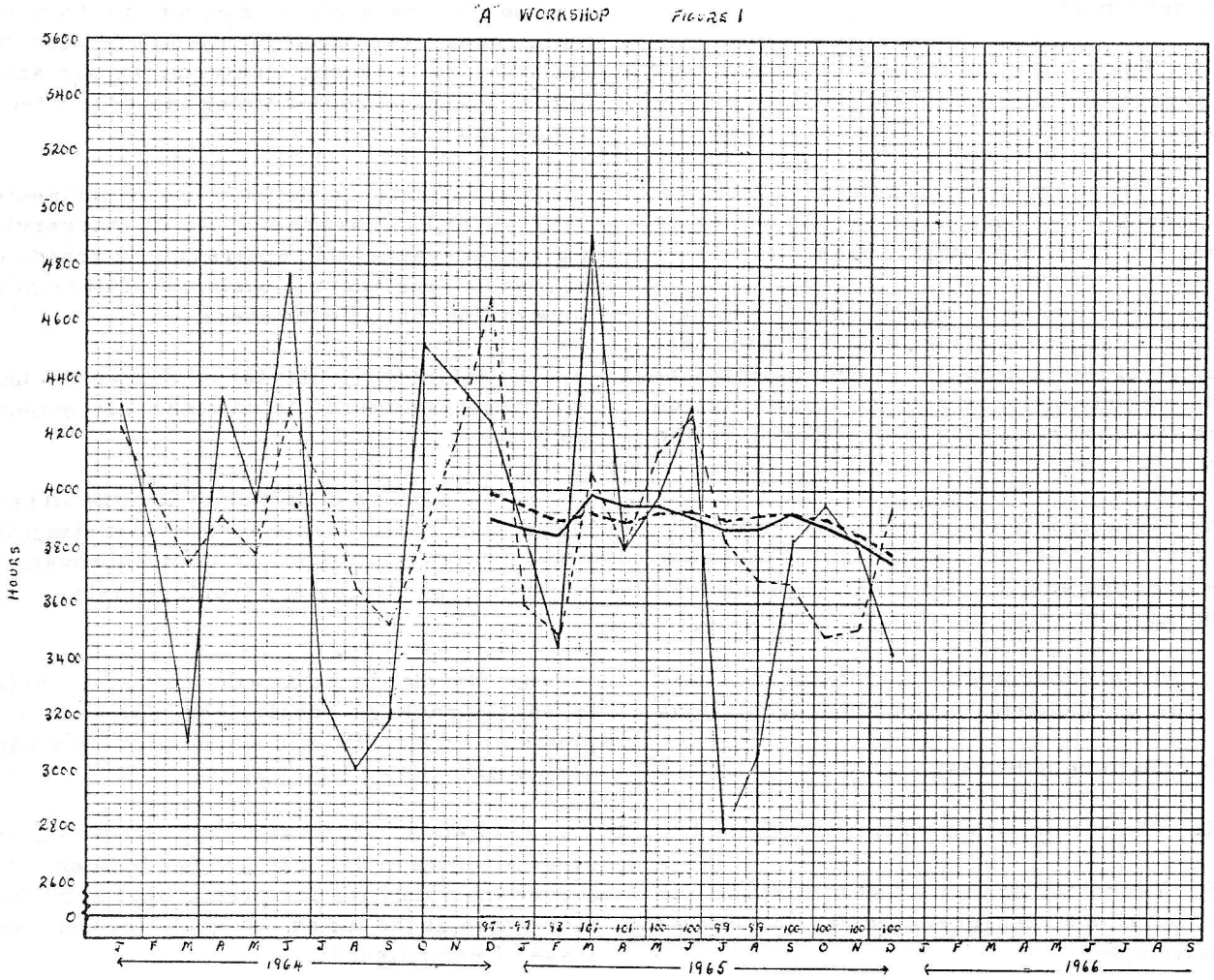
d. Develop basic data on life expectancies to enable package repair schedules to be implemented which in turn would provide a capability of programing repairs.

e. Relate labour and cost of spare parts or assemblies in order to provide indices from a cost analysis base for predicting the cycling of repairs at the most economic or optimum stage of equipment life.

f. Relate actual servicing maintenance and repair times, frequency of recurrence to standard servicing maintenance and repair times, as an indication of the effectiveness of manpower employment.

The introduction of new and more complex equipment in the services creates many more problems for management and a manager can no longer afford to guess at the best course

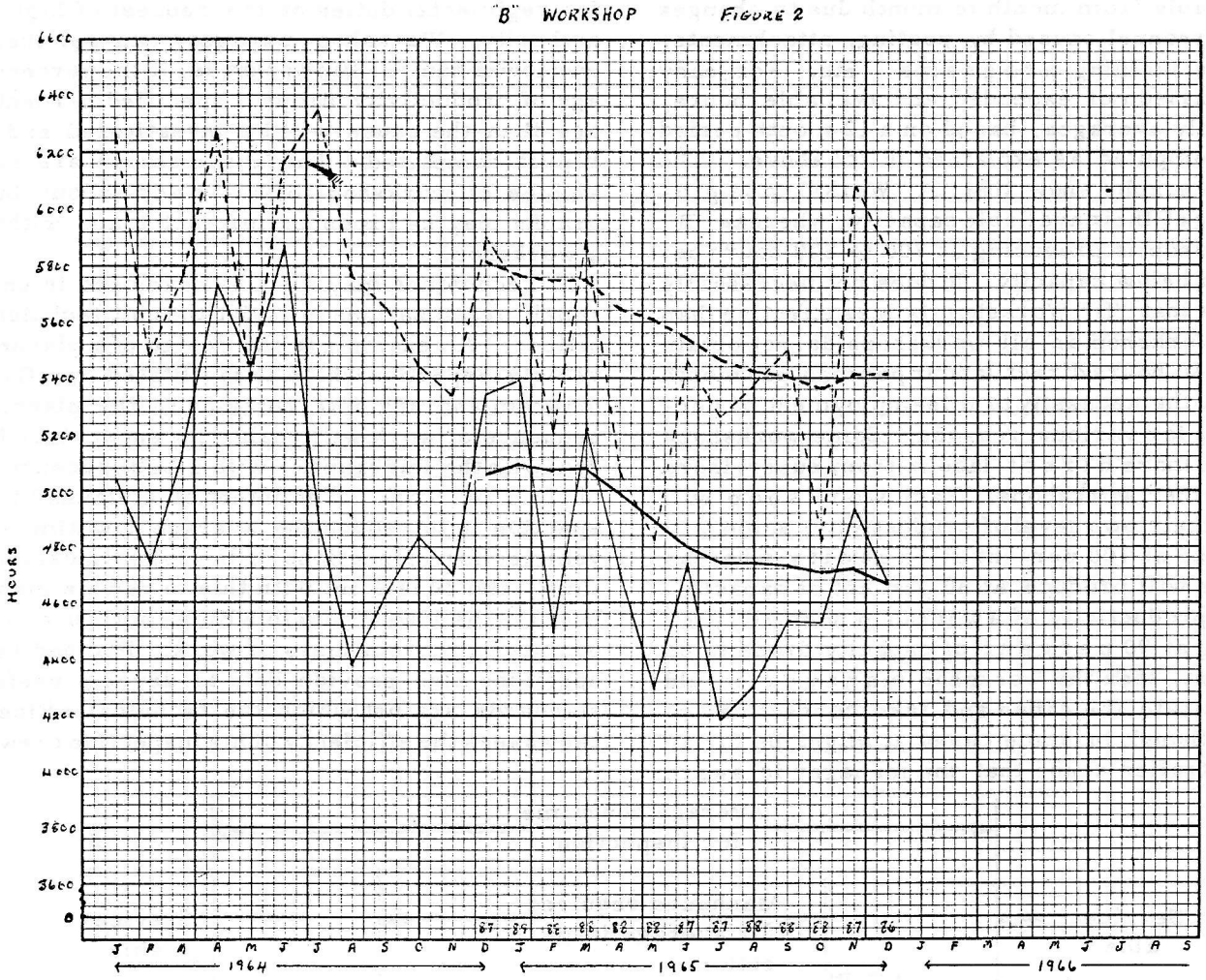
of action — a wrong decision is much more costly with equipment of to-day than it was 15 or 20 years ago. There are many techniques of mathematics and machines that can be brought to the manager's assistance; it is important that he understand them or at least appreciate their potential. Many techniques can be developed at the workshop level to assist the workshop manager, such as flow diagrams for work planning, control charts for quality control and graphs of statistical data. An example of this is a graphical display of manpower utilization from Monthly Time Returns. For instance, depicted below (Figures 1 and 2) is a graphical display of the comparison between direct labour available and expended over a period of several months for two workshops. Each workshop can compare their direct labour hours expended to their available capacity and any change in the general trend is much more noticeable in a graph than by laboriously examining columns of figures in several returns.



Legend

a. ---- Monthly direct labour hours expended as recorded in Serial 1 of Monthly Time Returns.

b. ---- Monthly direct labour hours available obtained from hours recorded in Serial 8 of Monthly Time Return excluding Adm & Con Overhead and multiplied by Proportion of Normal Time Available as shown in EME Manual Management K 010 Figure 13.



This is based on 100 hours of direct labour per military (Cpl and Cfn) and 130 hours of direct labour per month for civilian (Technician 2 and below) that are normally employed on direct labour activities.

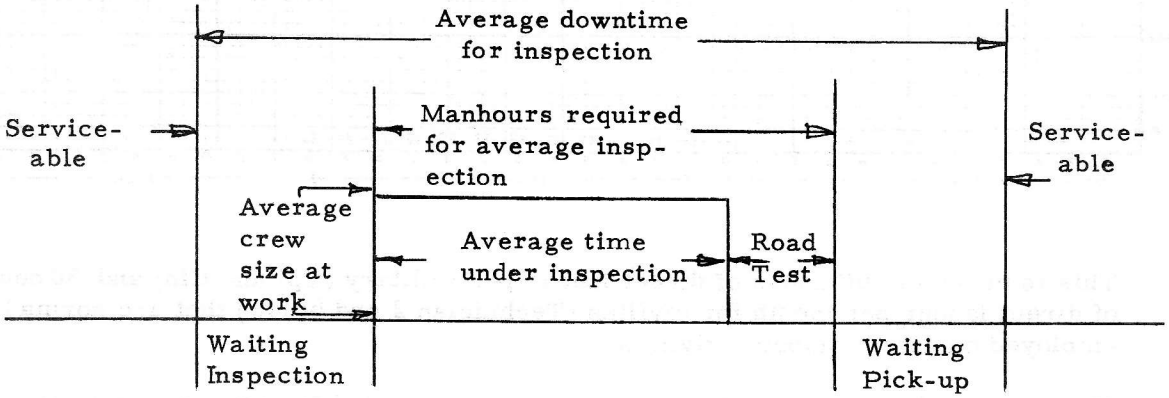
c. ---- Moving monthly average of direct labour hours expended for previous 12 month period, e.g. monthly average of direct labour hours expended for Dec 64 for "A" workshop is 3900 hours, this is the sum of direct labour hours expended for period Jan to Dec 64 inclusive divided by 12. Jan 65 is 3865 hours, the sum of direct labour hours for period Feb 64 to Jan 65 inclusive divided by 12 and so on for each month.

d. ---- Moving monthly average direct labour hours available for previous 12 month period computed in the same manner as for c above.

e. ---- The figures at the bottom of the graphs represent the percentage of productivity, that is, the monthly average of direct labour hours available is the standard of measurement or may be expressed as 100 and the monthly average of direct labour hours expended is expressed at the bottom of the graph as a percentage of the hours available.

The monthly direct labour hours vary considerably from month to month due to changes in personnel caused by posting, attachments, leaves, training programs, etc. For easy comparison of expended and available hours, monthly averages, based on a 12 month period are computed as explained in 'c' above. The above graphs show that "A" Workshop is producing at their available capacity, whereas "B" Workshop is producing at 700 to 800 hours per month below capacity. It does not necessarily follow that "B" Workshop is less effective than "A" Workshop as all workshops do not obtain 100/130 hours direct labour per man per month due to the necessity of misemployment of personnel for various reasons. Some workshops obtain more direct labour from supervisors than other workshops. Each workshop will have their own level of productivity: some will produce at 100 percent of capacity whereas others will produce at 80 percent of capacity. If the productivity of a workshop normally producing at 90 percent of capacity drops to 85 percent, then the workshop manager should investigate the cause and take corrective action; though in some cases it might be for an uncontrolled cause that the manager is aware of, such as commitment to provide personnel for regimental duties at the request of higher authority. Workshop managers can set their own lower control limit; that is, if the percentage of productivity drops a specified percentage than the cause will be investigated and a report completed. The above charts are examples of workshop total direct labour but graphs may be produced for each trade within a workshop.

Techniques may also be developed in unit repair organizations to assist the unit technical officer. An example is the design of a planned vehicle inspection which is facilitated by a flow diagram and any interruptions to the planned sequence of work will enable the supervisor to deal with the interruption with a better economy of time and work. The intent of a planned inspection is to reduce the average downtime of vehicles for inspections to the lowest possible limit, and consistent with this to reduce manhours to the lowest possible limits without compromising thoroughness of work. Planned inspections also provide data to develop useful standards against which the technical officer can assess the efficiency of his inspection crew.



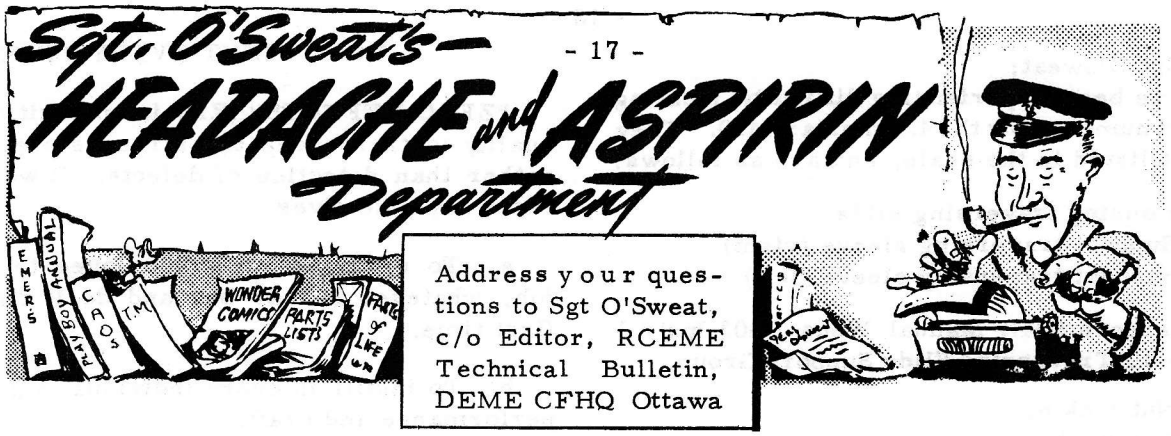
The average downtime for inspection can be reduced by;

a. Improving the scheduling of vehicles for inspections and thus reducing the period's waiting inspection and waiting pick-up.
b. Increasing the crew size to reduce average time under inspection; or
c. Improving methods of inspection to reduce manhours required for inspection.

A successful comprehensive maintenance management information system is dependent on a high degree of accuracy and timely submission of data for analysis to produce useful information in a usable form for all management levels. The modern manager must develop more precise skills and cultivate the science of gathering significant information to assist him in making the right decision.

Editor's Note

The foregoing are only preliminary thoughts on the problem. There are many ways in which information can be collected, analysed, portrayed and used. How about giving a maintenance management information system some thought from where you sit and forward your ideas to DEME? Help with the solution - don't become part of the problem.



Dear Sgt O'Sweat:

When we were Cfn commencing trades training at the RCEME School, loud weeping and wailing was heard whenever we had to write essay type exams. Now that we are older and I hope wiser, it can be seen that this type of exam has much merit. In fact it should be considered that the essay type exam has more use than first meets the eye; consider if you will that a good senior NCO or WO has to write reports and letters of all types.

S sgt RC Brimmage
2 Field Workshop RCEME

Dear S sgt Brimmage:

I peeked in the "who's where" listing of the July 1965 Bulletin to determine if you were asking about essay type exams as a seasoned, hard-nosed instructor presently employed in the Corps School, or as a senior tradesman makin a point. I think the latter is the case.

Before I answer your questions, I would like to explain to the less experienced what an essay type exam or more specifically what an essay type question is. An essay type question is a question consisting of a broad statement or question followed by directions to "discuss" or "explain", "list" or "enumerate". The student is required to make a comparison, write a description or explain certain points.

It is agreed that the use of essay type questions and exams does in fact serve two purposes by testing a person's power of expression and making the student think. It also follows that students gain a side benefit in that their ability to prepare reports and letters would be increased through practice in answering essay type questions. However, as with all things there are also clear disadvantages in that this type of exam or question gives narrow coverage of the subject, is difficult to score, and subject to human bias. Normally this type of question can only be used once.

In summary, your point on the value of the assistance this type of testing gives to NCOs and WOs in the preparation of reports and letters is somewhat countered by the disadvantages stated above and most instructors would avoid essay type exams and questions if given the choice in favour of the objective type exam which makes the instructor's lot a little more endurable.

Sgt O'Sweat

Dear Sgt O'Sweat:

I have recently completed an APC M113 course at the RCEME School. My problem is:

We were told that there were many mistakes in the publications that we had to use for reference.

Could this not be corrected as the books in most units are not amended?

Sgt FR Bingham
2 Field Workshop RCEME

Dear Sgt Bingham:

Changes in the Technical Manuals concerned are being made as shown below. These will be distributed just as soon as they are received in MATCOM HQ.

TM9-2300-224-20/2/1 Part 1
Changes 1 and 2 are now being printed in the USA.
TM9-2300-224-10/2/1 Changes 1 to 3 are now in print.

Sgt O'Sweat

Dear Sgt O'Sweat:

I have been experiencing difficulty locating the part numbers for the 4.2 mortar M30. They are not listed in the scale, and are as follows:

Housing traversing slide
Support traversing sleeve (right)
Support traversing sleeve (left)

Reference EME Manual Wpns J 403 Instr 1 Figure 10 Traversing Slide Support Group.

Nut locking
Cap seal

Reference EME Manual Wpns J 403 Instr 1 Figure 1 page 2, letters M and V, Mortar Assembly.

Pin Stop - This pin is threaded 1/4 20 UNC

Reference EME Manual Wpns J 403 Instr 1 Figure 3, letter L, Coupling and Sight Mount Group.

Having read your columns in the past I have taken your suggestions into consideration regarding such problems encountered by other tradesmen. I have gone to the MPC in SPSS, but am still unable to come up with the part number.

I have considered supplying a sample of the part to RCOC but this would render my equipment out of action which I must try and prevent whenever possible.

Cpl GW Grogan
4 RCHA

Dear Cpl Grogan:

The CASM for the equipment is still in the production stages and an anticipated date of availability cannot be obtained. In the meantime we have located numbers for the first three items as follows:

Housing 1015-00-714-4184
Support right 1015-00-714-4136
Support left 1015-00-714-4138

The nut locking and pin stop are items 139 and 20 in the Field Scale M/SA/46 which should be available to you.

The cap seal is a non-scaled item in both Canada and USA but the drawings are available. The need for it is being examined and if warranted production and scaling action will follow.

Sgt O'Sweat

DO IT RIGHT EVERY TIME

"ZERO DEFECTS" (ZD) is an exciting new quality control concept that stresses prevention rather than detection of defects. It works on three key objectives:

a. To motivate every employee to do his job, whatever it may be, and do it right the first time.

b. To instill in every individual a pride of performance and craft.

c. To stimulate each person to strive to prevent errors before they occur.

Can such a goal as 'Zero Defects' be reached? The Martin-Marietta Corp., one of the early exponents of the idea, used this illustration in promoting it. Here it is, in part:

"...people don't always make mistakes -- like most of us have been led to believe. He found out from the payroll department that out of 600,000 cheques issued, only a few had to be replaced because of loss by employees. He called an Orlando bank asking if any Martin employee has ever reported being shortchanged on his cheque when it was cashed. The bank had no memory of any such cases. Reasoning it out a little further, he found that people don't go to the wrong house upon going home. They don't report to the wrong work area by mistake. They find their cars on crowded parking lots. In general, people just don't always make mistakes on repetitious tasks."

How about that! Maybe it's just a matter of attitude and attention.

You'll be hearing more about this new "creed for craftsmen" in future issues of the Tech Bulletin. Why not write a letter giving us your ideas on doing things right the first time.

SPANNER SPEAKS

The first tip of the RCEME cap goes to Cfn Hopkins of fightin' Vehicle Platoon. About two months back "Hoppy" wandered down Fort Anne way to attend a Junior NCO course. Last week he wandered back, clutching his hard-won qualification in his hand. We're all proud of you, Hop.

The second bow is for several of our sports

(continued on page 21)

EME MANUAL ISSUES

Electrical B 340/1
Detecting Set, Mine, No 4c
This set is a modified version of the 4A and uses a transistorized amplifier which reduces the overall weight.

Electrical D 667 Instr 1
Transmitter, Radio 5 KW
Details the drilling of holes in fuses of the RF channel.

Electrical K 247 Instr 1
Power Supply Vibrator No 12 Mk2
Removing the vabrator cover.

Electrical K 764
Radio Control Harness Type B
Field and Base repair procedure

Electrical K 781
Control Radio Set, C-5094/PRC
Operating instructions

Electrical U 147 Instr 1
Terminal Telephone TA 5006A/U
Replacement of resistor R88 with one of greater wattage.

Electrical V 669 Instr 4
Lead Acid Batteries, BB-46
Test specifications.

Electrical G 760
Radiation Detection and Alarm Set AN/FDR-501A
Data summary

Electrical I 420
Receiver/Transmitter RT 524/VRC
Data summary.

Electrical K 250
Power Supply, Electronic, PP-5095/U
Data summary.

Electrical K 766
Radio Control Harness, Type B
PRS and SRT Reissue.

Electrical K 776
Radio Control Harness, Type A
PRS and SRT Reissue.

Electrical Q 117 Instr 2
ENTAC ATK Guided Missile System
Addition of locknut to cable ends.

Electrical X 337 Instr 1
Reel Unit RL 31
Modification to A frame arms.

Engineer Equipment M 417 Instr 2
Compressor, Air, 125cfm Bristol
Drawbar lunette relocation.

Engineer Equipment M 377 Instr 6
Broomwade Air Compressor 250 cfm
Concerns blowdown valve air intake and bypass valve.

Instruments A 122
Maintenance of Chronometers, Clocks and watches. Reissue.

Instruments B 440
Light Unit, 84 mm Gun, Mkl w/e
Data summary.

Instruments B 549 Instr 3
Case and Light, Instrument, Sightunit C1
Addition of lock washers.

Vehicles T 219 Instr 5
Trailer, Cargo, 3/4 ton, 2 wheel
Security screening kit.

Vehicles T 319 Instr 5
Trailer, Cargo, 1 1/2 ton 2 wheel
Security screening kit.

Vehicles A 110
Provisional Condemnation Policy SMP Veh
Reissue

Vehicles A 114 Instr 1
Repair Expenditure Limits
Amendment, page 0

Vehicles E 039 Instr 28
Truck, Ambulance, 1/4 ton, M38A1
Transfer of kit from M38

Vehicles L 103 Instr 2
Carrier, Full Tracked Armoured
Injector fuel pipe connections leaking

Vehicles L 107 Instr 1
Carrier, Full Tracked, Armoured
Clearance light and turn signals
(Distributed to 25 COD and units in Europe

Vehicles N 029 Instr 6
Car, Armoured, Ferret, Mk 1
Generator gear box lubrication

Vehicles T 557 Instr 1
Trailer, Stake, Tracked
Tow bar attaching pin

Vehicles Z 060 Instr 14
Bus, Motor, 60 Pass, SC
Data Summary

Weapons G 162
Adapter, Subcaliber, 84 mm Gun L1A1
Description

Weapons I 270 & I 273
Mount, Machine Gun
Data summary, and Description

General H 100
Technical Equipment Fault Reporting
Reissue of Annex A

Management H 040
Price of SMP and Tkd Veh Assemblies

Management L 101
RCEME Services by Contract
Reissue

Management L 102
Local Purchase Order (LPO)
Reissue

Management L 104
Contract Demand (CD)
Reissue

Management L 107
Petty Cash (PC)
Reissue

Aviation Equipment A 110
Index to RCAF Engineering Orders
Reissue

Aviation Equipment P 020
Aircraft Repair
Reissue

Electrical B 342/1
Detecting set, Mine, No 4C
Technical description

Electrical B 345/1
Detecting Set, Mine, No 4C
Periodic Insp and fld rep standards

Electrical I 167 Instr 4
Radio Set, CPRC 26
Repair to Handset H-5001A/PRC

Electrical K 249 Instr 2
Power Supply Vibrator No 12 Mk 2
Common faults encountered

Electrical K 627 Instr 1
Handset, H-5003/PRC
Fitting of new type pressel switch

Weapons A 671 Instr 3
Hydropneumatic Recoil System US Type
Reissue of inspection procedure.

Weapons G 150
Gun, 84mm, Inf, ATK, L14A1
Data summary

Weapons G 152
Gun, 84 mm, Inf, ATK, L14A1
Description.

Weapons G 169 Instr 1
Adapter, Subcalibre, 84mm Gun
Marking of positioning line.

Weapons I 270
Mount, Machine Gun
Data summary.

Weapons L 407 Instr 4
Launcher, Rocket, 762mm, Truck mtd, M386
Installation of rear stabilizing strap.

Instruments S 280
Electrical W 720/2
Periscope, M19
Data summary (dual responsibility))

Electrical U 144 & 145
Terminal Telephone TA 5006A/U
Amendment Page 0

SUGGESTIONS RECEIVED

The following suggestions have been submitted by military or civilian personnel in the Corps. Some will be adopted and many will be 'shot down' for various reasons. However, they are the best evidence that RCEME people are constantly using their heads.

These files were received in DEME during January to March. The publication of the particulars here does not in any way imply their acceptability.

Suggestor	Suggestion
Sgt JA Porter 224 Workshop	Use of non-melting silicone lub on eyepieces
Ssgt KA Thorne 23 Base Wksp REME	Changes to PRS on IHC 5 ton 6x6 spray unit
Lt B Tomlinson 224 Workshop	Silicone lubricant for use on binocular eyep
WO2 W Greenshields HQ 4 COBG	Changes to Maint Grdg score for weapons
Mr EW Bolton 27 COD W/B	Modification to wrench for jeep switches
Ssgt WC Bodine 214 Workshop	Maintenance of return springs by unit pers
Mr RA MacDonald 27 COD W/B	Method of counterboring bolt holes in Ferret
Ssgt RF Schlueter 8 Coy	Mod to O ring in binocular Prismatic No 2
Cpl R Donesley 4 Fd Wksp	Modification to switch assembly to headset H161/U
Cfn JA Colbon 4 Coy	Tool for removing fuze M52A2
Mr Gaston Parent 202 Base Workshop	Modification to engine compartment Centurion
Ssgt RC Brimmage 2 Fd Wksp	Simplify method of pre-instructions
Ssgt AR Miller Camp Petawawa	Method for adjusting wheel bearings Ferret
Mr C Lawrence 202 Base Workshop	Puller for Centurion escape hatch
Cfn JW Dafoe 8th Hussars	Relocation of oil pressure switch on Ferret
Ssgt LW McPhee 2 Fd Workshop	Positioning jig for jeep transmission shafts
Cpl GL Arnold 4 Fd Workshop	Use of standard electrical generator form
Ssgt LW McPhee 2 Fd Workshop	Improvements to jeep carburetors
Mr H Pearce (3) 27 COD W/B	Replacement slave cylinder line check valve Oil pump gear lubricator 1/4 & 3/4 tonSMP Modification to manifolds on 5ton SMP
Sgt JB Latulippe Camp Borden	Modification to S/A aiming stand C1
Mr David Fenn 27 COD W/B	Relocation of inter-vehicle cable receptacle

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(SPANNER SPEAKS from page 18)

car and driving buffs. Over the past several months we've noticed, in results of competitions held by the Brigade Motor Club, several familiar names. These names are generally at or near the top of the standings. They include Lcpl Gates, Cfn Rigby, Cfn Ward, Cfn Hopkins, Cfn Maclennan, Cfn Atkinson and Cfn Beeler. It should be noted that they bring the same high standards to their work that they apply to their driving.

Finally, let's take a look at the Hockey scene as the season closes. Several members of the shop participate in minor hockey as coaches and managers. This is a very worthwhile way to spend your time, and some of "gasthof commandos" would do well to profit by the example of these hockey boosters. To single out two of the more successful ones, we would like to commend Cpl Ripley of the FRP and WO2 Taylor of Weapons and Electronics. Cpl Ripley coached both a minor hockey team and the unit team this year, as well as being involved with the Chambly Corporals' Mess team. WO2 Taylor is coach and general factotum of the Soest Kliene Huskies, one of the most successful teams in the area. Unfortunately for Soest minor hockey, both of these gentlemen rotate this summer. So, when the call goes out for volunteers next fall, give the youngsters a hand by offering your talents as the others have.

NEW ANTI-TANK GUN

Ssgt KI Shepherd

In September 64 the Canadian Forces adopted the M113A1 Carrier to enable the infantry to go into battle, with the maximum comfort and protection. To prevent an enemy from doing likewise the Canadian Forces have now adopted the Gun 84 mm Infantry Anti Tank L14A1 (Carl Gustaf).

The weapon is recoilless and is intended primarily as an anti-tank gun but is also well suited for other roles such as attacking armoured personnel carriers, pill boxes, machine gun posts and troops in the open.

The type and performance of the ammunition available make the gun 84 mm, Infantry, Anti Tank L14A1 an ideal all purpose weapon for every direct fire task. Practical firing ranges are:

a. High explosive anti tank shell at moving targets up to 450 metres/500 yds.
b. High explosive anti tank shell at a stationary target up to 500 metres/600 yds.
c. High explosive and smoke shell up to 1000 metres/1100 yds, and flare shell up to 1500 metres/1650 yds, Practical rate of fire is 6 rounds per minute.

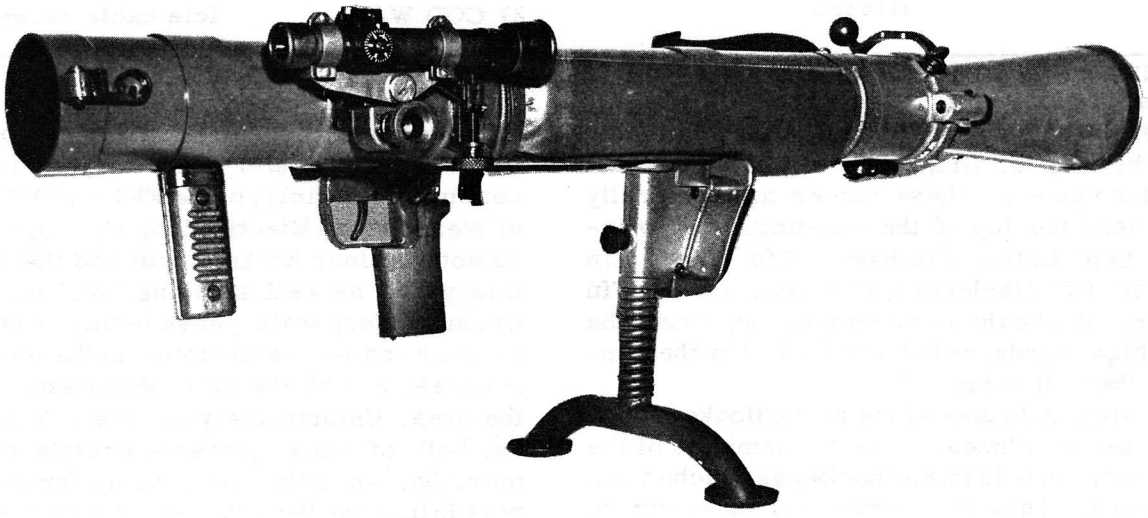
The weapon is normally operated by a team of two men but can be carried by one man. Due to the recoilless nature of the gun, the explosive blast on firing creates a danger zone to the rear. The weapon may be fired from the standing, kneeling, or prone positions. A gun mount is provided for the prone positions, it can also be used as a steady in other positions.

The sighting gear is assembled on the left side of the gun. It consists of a telescopic sight and open sights. Illuminated sight adapters are provided for use with the open sight during night firing. The telescopic sight, which is the primary means of laying the gun, consists principally of a telescope, rocker bracket and range drum bracket. The open sight provides an auxiliary means of laying the gun and consists of a foresight and rear sight.

The weapon consists principally of a barrel with chamber, venturi, venturi locking strap and percussion type firing mechanism.

A recess is cut in the periphery of the venturi to fit over the cartridge guide. (This guide is necessary to position the round correctly as the primer is on the side instead of the normal position in the base.) Fitted around the rear of the venturi is a rubber band which reduces noise if the venturi is struck accidently against hard objects.

The primary function of the locking strap is to lock the venturi mechanically in the firing position. It is also adapted to carry out two other functions, ie, carry and operate the ex-



tractor and to give a mechanical safety arrangement for the firing mechanism.

The firing mechanism is contained in a tubular housing which is secured to the right side of the barrel. The forward end houses the trigger gear and safety catch.

The adapter, sub calibre 84 mm is a practice weapon designed to load into the gun, in the same way as the normal full calibre round and is almost identical in shape. A5. 6 mm tracer round with a reduced charge, is fired to produce at normal fighting ranges, ballistics which are very similar to those of the operational round; provision is also made to load and fire simultaneously a 15mm indication cartridge, to simulate the blow back of the parent weapon.

A canvas cover is provided to protect the weapon when it is being transported on vehicles, etc. The weapon is strapped on a wooden base which helps to protect it from damage during shipment. Three water proof rolls are issued with each equipment, one contains tools spare parts and bore sighting attachments, another contains a jointed cleaning rod, box with oiling brush and a box with cleaning brush, the third contains the dismounted optical sight Unit.

The advantages of this weapon over those now in service are considerable. It is in service with the Netherlands, Danish, West German, British and Swedish Forces, therefore ammunition and spare parts can be interchanged. Tools and equipment issued with each weapon allow the user to carry out minor repairs, bore sight and clean the weapon. The weapon is ruggedly made and will stand up to rough usage. It is short in length (4 feet 3 inches), suitable for air dropping and easily transportable with a high degree of readiness.

Ammunition for this weapon can be used in all types of climatic conditions. With minor adjustment to the sights it can be used for night firing. The sub calibre device allows personnel to be instructed on the handling and firing of the weapon economically. This weapon will give the infantry soldier increased fire power with a variety of ammunition, without diminishing mobility.

ENTAC Mounted On Volkswagen MK1 (Cdn)

THE 'REAL TIME' REVOLUTION

By Phil Fellows, Univac Project Manager,
BEA Passenger Seat Reservation System

Real time computer systems have been commercially available for several years in the United States and Britain. But they have sneaked rather quietly on to the business scene and in consequence their revolutionary character has gone largely unnoticed. In fact, however, the changes in management techniques and responsibilities which real time computer systems have triggered off in the few organizations which have so far used them are much more fundamental and widespread in effect than any so far brought about by the introduction of "conventional" computers.

What are these changes and why are they so important? Before these questions can be answered it is necessary to outline some of the fundamental characteristics of real time operations – characteristics which make the computers which employ them basically different from any previous form of data processing system.

The essential character and purpose of a commercial real time computer becomes apparent when one realizes that the first real time application was the control of guided missiles – a task that demands constant, detailed and highly accurate communication between the fast-moving missile and the computer. As the rocket moves out into space, it logs its progress by automatically feeding data to the controlling computer. The computer scans this data to find out whether the missile is following its course and feeds back instructions as the situation demands. These instructions it obtains by extrapolating the received data so as to calculate the position of the rocket by the time the return message reaches it. Though the delay is measured only in microseconds the missile will, of course, have moved a considerable distance during this period.

Commercial real time systems provide the means to apply a similar concept to business management – sensitive, instant-by-instant control as distinct from a series of discrete jerks relatively widely separated in time which is the best that can be managed with conventional systems.

Thus, a commercial real time system has facilities for constant and random input of small items of data into the system, the instant handling of these and the initiation of suitable action. This action, depending on the application, might take the form of a visual or printed signal at a communication station or the updating of information on magnetic files or a combination of these. The data itself might comprise, say, notifications of movements of individual bank accounts, enquires on the availability of stores or seats on airlines, or requisitions for these stores or seats. The enquiries or facts may be fed into the system from many communication points some or all of which may be hundreds or even thousands of miles distant from the central processor. Action may take the form of a feedback to the originator of the signal, accumulation of data at a centre or the production of instructions at a different communication point.

Capacity to handle data on this continuous and instant-by-instant basis demands an ability to retain enormous stores of current information in a very quickly accessible form – that is, on line. The computer must, in fact, be able to scan all the data relevant to the answer it is expected to produce.

In a real time system which linked a number of large storage depots the computer, fed with an order, would be required to review without delay the supply position, starting with the depot nearest the address of the customers and, if supplies were not available at this, moving outward until it located the required items. It would then produce the necessary information at the depot it had selected. Simultaneously, the inventory would be updated.

One American bank which uses a real time computer system has a communication station at each branch. When a customer presents a cheque or deposits cash, the clerk keys the details directly into the computer. If, at

this point, the customer wants to know what his balance is, the clerk keys in an enquiry and receives an answer immediately. As soon as the transaction is entered, the computer also updates the bank's ledger accounts as well as that of the individual. The management is therefore able, at any given moment, to ascertain the precise up-to-the-minute financial position. This information need not be printed out but may be displayed on a device similar to a television receiver.

Contrast this method of operation with that of a conventional computer system. There, although the system may have facilities to pull out certain facts on a random basis, access to the information is relatively slow and the system as a whole cannot operate efficiently and economically until a sizeable batch of data has been accumulated for processing. (It should, perhaps, be made clear that a real time system also incorporates full facilities for batch processing work which it often may handle concurrently with real time jobs. Real time demands must, of course, take priority or the whole concept loses its meaning. But, properly programed, the system switches continually between the two types of application, making optimum use of the processor and peripherals while maintaining real time priority.)

Broadly, then, the unique characteristics of a real time computer system are its almost limitless flexibility and its instantaneous random access to huge data stores. These together offer management the opportunity for a form of continuous control using a feedback system somewhat analagous to an automatic process control system.

Possibilities like this must make heavy demands on management. In fact, they require no less than a complete re-definition of basic objectives and reorganization of a kind far more drastic than has ever been needed for conventional computer systems. In fact, managements contemplating the installation of a real time system must dig far deeper than their predecessors had to when contemplating use of the first-ever computers.

Unaware of it though we may be, our current thinking about data processing is completely conditioned by the essential rigidity of a conventional computer – a rigidity far greater than that of a manually operated system. Using a conventional computer, management can certainly obtain information of a type and on a scale never before available. But, at the same time, no answers can be forthcoming until the system has systematically chewed its way through a large mass of data and collated the information it gathers en route. Consequently, management has accepted a way of life in which flexibility is sacrificed in return for getting more accurate, comprehensive and significant information far sooner in time than would be possible by any other method.

AGE OF THE QUILL PEN

Inevitably, perhaps, inflexibility of thought has accompanied the rigidity of the computer system. Though it is true that many companies have fairly drastically overhauled their structures and methods of operation so as to achieve some degree of integration, this integration is superficial. Routines used in even the most sophisticated and integrated batch processing operations are almost always, at bottom, nothing more than streamlined versions of far older working methods. Traces of the quill pen and ledger age are as apparent as were the marks of the horse and carriage era in early models of automobiles.

But a real time operation, if properly planned and programed, should be as unrelated to earlier patterns of thought as a 1965 Jaguar is to the surrey with the fringe on top. This is why basic re-thinking is necessary and why top management must become intimately involved in any real time project from the start. In the past it has been permissible (or even desirable) for top management virtually to rubber-stamp proposals put forward by its middle management and outside technical specialists. But this approach cannot be acceptable when fundamental reorganization is demanded.

To define basic objectives sounds a childishly simple task. In practice it often proves difficult. In many organizations, these objectives have never been clearly defined or analysed, since this process probably seemed redundant when the company began its life and no one thought to carry it out subsequently.

The most elementary definition of all is: "to make a profit". But closer examination of current operations loosely assumed to be directed toward this end may reveal a very different picture. It may well be found, for example, that a sizeable proportion of total operations are, in fact, geared to small departmental objectives which is probably not the best method of achieving the company objectives.

Ruthless examination and analysis of purpose is therefore necessary. This must then be followed by careful analysis of what information is required, at what points in space and time and so forth. Enlightened management must often, in the light of results achieved in this way, be prepared to discard certain cherished pre-conceptions about its operations. Optimum results and economic costs can usually best be achieved in real time systems by excluding entirely from the main scheme certain exceptional requirements. Insistence on including provisions for items of marginal value may result in swelling files and complicating otherwise relatively simple programs to unmanageable proportions.

Control of the type and quality offered by a real time computer system demands a degree of integration far higher and more far-reaching than any yet conceived for conventional computer systems. And this, in turn, implies the sweeping away of existing departmental boundaries and basic changes in the nature of jobs and responsibilities.

A specific example may help to clarify this. Consider the organization of a commercial airline, carrying passengers and freight and operating in a conventional way. The company is broken down into scores of almost watertight compartments whose activities and responsibilities include: booking seats for passengers and space for freight; producing passenger tickets and freight documents; accounting to travel agents and other airlines who issue tickets on the airline's behalf; seeing that suitable aircraft are available at scheduled times; detailing crew to man the aircraft; logging details of crews' duties so that each man spends no more than the statutory number of hours on duty yet pilots obtain the necessary variety of experience to maintain their qualifications; paying crews' salaries and allowances; logging data on hundreds of thousands of aircraft parts and instruments to ensure none is used longer than the regulation period; seeing that spares and personnel are maintained at the proper level at scores of scattered locations; ordering and scheduling catering supplies; arranging transport to and from pick-up points to the airport; ordering and accounting for fuel supplies. The list could be extended almost indefinitely.

Normally, each department involved in these operations operates semi-independently and produces and receives vast numbers of documents. A real time computer system, with its ability to accept, process and co-ordinate a wide range of data maintained on fast random access files and fed in at hundreds of distant points, allows integration of these functions on a scale that would otherwise be unthinkable. Basically, there are two main sources of information on which all these operations depend: passenger and freight details; and flight information.

BOOKED BY COMPUTER

Passenger information can be fed direct into the computer from communication stations which, in turn, are reached by the public via ordinary telephone lines. Operators, having queried the availability of seats on a desired flight via the communication device, make an actual reservation by the same means, at the same time keying in personal details about the passenger. The moment this entry is made the computer updates the seat inventory and automatically stores various parts of the information in other locations. Subsequently, it can automatically issue tickets, print monthly invoices for agents, produce statistical data on seat sales, produce passenger lists for use at check-in points, instructions for catering services and so on. All these processors are triggered off by either a manual enquiry or by a pre-set time signal, no build-up of documents either in English or a machine language having been collected. There are no elaborate paper files – only records of the existing situation. (It should perhaps be added that elaborate precautions are made to eliminate any possibility of destruction of these maghetic files.)

In the same way, factors relating to aircraft and crew can be completely co-ordinated by using a combination of manually entered detail and stored information. As soon as an aircraft leaves the ground input data can be fed via communication stations and similar detail will be keyed in as the plane lands. These entries will trigger off automatic production of such documents as notifications that certain instruments must be replaced after landing, crews' pay, flight information and so forth.

Necessarily sketchy though this outline is, it may serve to illustrate the scale of reorganization that the real time system demands. Scores of middle management, in particular, who have previously presided over small insulated empires will find themselves

directly responsible, though direct communication with the computer, for handling information with organization-wide repercussions. Experience has already shown that the effort required to learn a completely new job and adopt a completely new approach has been well worthwhile. And often unexpected potential has been revealed in men whose previous work, though responsible, has been basically undemanding.

To top management, the real time computer system offers a tool whose power and potential has as yet scarcely begun to be exploited – a tool which, properly used, provides a hitherto undreamed of measure of flexibility and control. In fact, it is hardly extravagant to claim that the much talked of electronic revolution only began when real time computer systems were evolved.

-THE MANAGER

Contributors to the RCEME Technical Bulletin in the Last Two Years

Jul 64

Lt Col RH Hodgson,	DEME
Lt JF Boudreau	R School
2LT JD Choquette	R School
Capt WJ Shearing	DEME
Major BM Diebert	14 Coy
Capt DH Curling	FGH
Capt RDL Connell	CJATC
WO2 KE Kraemer	R School
Sgt RR Gibson	CJATC

Oct 64

Ssgt P Johnson	DEME
Major BM Diebert	14 Coy
Major HA Rosson	DEME
Lt Col RH Hodgson	DEME

Jan 65

Capt RDL Connell	CJATC
Capt RM Mimee	56 Inf Wksp
Ssgt P Johnson (2)	DEME
Capt WJ Shearing	DEME
WO1 RH Stewart	R School

Apr 65

Major JM Treleaven	Comp Gen
Major BC Clerke	DEME
Major HW Chapman	R School
Capt FA Ouimet	DEME
Ssgt P Johnson	DEME

Jul 65

Major CG Lawrence (2)	DEME
Capt NA Graham	4 CIBG
Capt FG Hutson	4 CIBG
WO2 F Babb	DEME
Ssgt P Johnson	DEME
Cpl EA LeFort	2 RCHA

Oct 65

Lt Col RH Hodgson	27 COD
Lt RJ Ferguson	R School
Lt RE Betzner	R School
Capt JGR Doucet	CASC

Jan 66

Capt WM Campbell	3 CIBG
Ssgt P Johnson	DEME
Major BM Diebert	14 Coy
Capt DB Perrin	

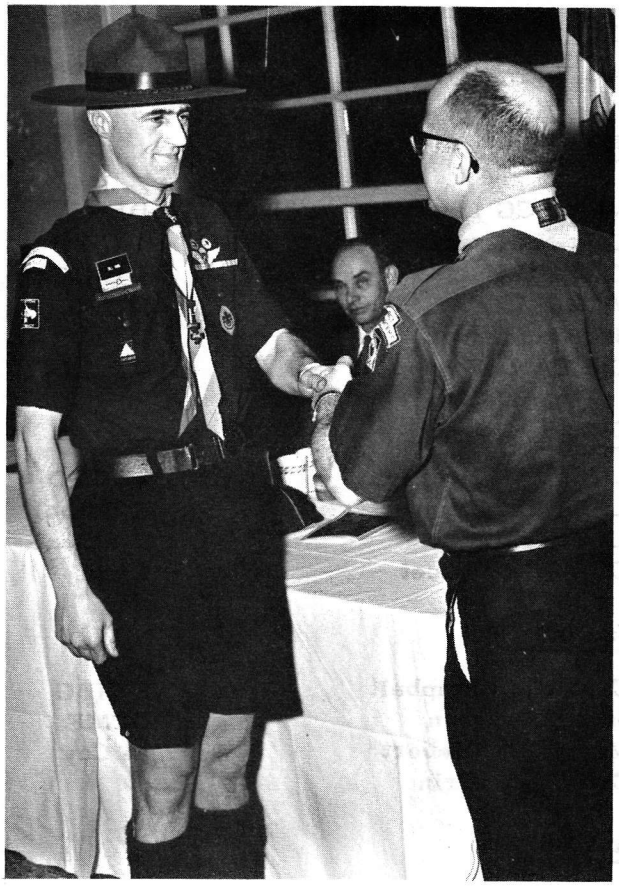
Apr 66

Lt KW Henderson	DEME
Capt RMG MacKenzie	2 Fd Wksp
Lt RE Betzner	1 Fd Wksp
Ssgt P Johnson	DEME
Ssgt KI Shepherd	R School
Ssgt GJ Turcotte	R School
Major WH Norton	DEME
Major DH Fraser	Tanzania
Lt JI Hansen	4 Fd Wksp
Capt WC Baird	R School
Capt WJ Groome	DEME

SCOUTER RECOGNIZED FOR LONG SERVICE

Last Thursday (25 Feb) at the 1st Petawawa Garrison Parent and Son banquet Scouter Ssgt WG (Bill) King, 8 Coy RCEME, was awarded a 15-year long service badge. A fitting award indeed for a Scouter so devoted to the Pack and boys that he spends every week with. He always has a smile for the lads no matter what the situation.

He is shown receiving the award from District Commissioner Earle Marin (WO2, 2Fd Wksp).



Scouter Bill started his career way back in 1936 as a Cub and passed from Cubs to Scouts in 1940. The 1st Burnaby Scouts and Cubs saw Bill as their leader after that and here he wrote his Part 1 Wood Badge and took Pack Scouters course. In 1956 Bill passed his Part II Wood Badge and started the 52nd Calgary Cub Pack. Finally Bill came east and ended up at Kingston where the 1st Fort Henry "E" Pack claimed him as theirs, first as assistant Cubmaster and then as Cubmaster. After three years he was posted to Camp Petawawa last year and he quickly sought out the leaders here and offered his experience. It was a grand day that brought Scouter Bill into our midst and a Pack was given to him. "B" Pack has come along famously since then but, of course, Bill cannot claim all the credit as he has wife June at his side. She is just as active and just as patient. More Scouting families like this are needed in Camp to look after tomorrow's citizens. It is hoped that Scouter Bill spends many happy years here where he is needed.

- Camp Petawawa Post

33rd TECHNICAL SQUADRON (MILITIA)

The officers and warrant officers of 33 Tech Sqn RCEME(M), Sudbury, Ont held a dinner on 24 Feb 66 in honour of the visit of Lt Col HM Robinson, the Comd EME Central Command. Following the dinner, a parade was held in the Sudbury Armoury where Lt Col Robinson inspected the unit and presented awards won during the past year. Accepting the awards on behalf of the unit are (l to r) WO 2 Ken Hill, WO 2 Bill Cunningham and WO 2 John Cram. On the right is Lt Col HM Robinson. The awards won by the unit are RCEME Corps Association awards for: Leading Dominion Unit in Rifle Competition, High Score in Command in Rifle Competition and High Percentage in Command in Tradesmen Competition.

"WINTER EXPRESS"

(Editor's Note: The following letter was received by WO1 Alex Jackson, DEME, from WO2 Frank Babb, DEME observer on Exercise Winter Express. His words are not the final, official report, but they do give a first-hand account of some RCEME problems in a modern army.)

Exercise Winter Express
Bardufoss, Norway, 7 Mar 66

Dear Alex:

So that you can locate this area on a map, it is about halfway on a straight line drawn from Narvik to Tromso. The airport compares to Rockcliffe in size; built by the Germans during the Second World War, it is complete with underground hangars. My first impression was that the area looks like the Gatineau but much more thickly populated.

DEME should have at least one rep from each trade; there is just too much going on to see which makes it tough to keep a clear line of thought.

In a few hours I had met a British Army aviation warrant officer from Middle Wallop; he had with him an inflatable shelter 53 feet long, by 29 feet wide, by 15 feet high, weight approximately 2000 pounds. Major JP Harrison, CD, CO RCASC Heavy Coy, had pointed out all the shortcomings of his vehicle heaters in jeeps; cannot defrost adequately, etc. He wanted me to take special note of the Norwegian version of the jeep built by Volvo. I must admit the Canadian Army vehicles I've seen so far remind me of SPARTON in the Canadian lines. It could well be 1943 — things haven't changed that much.

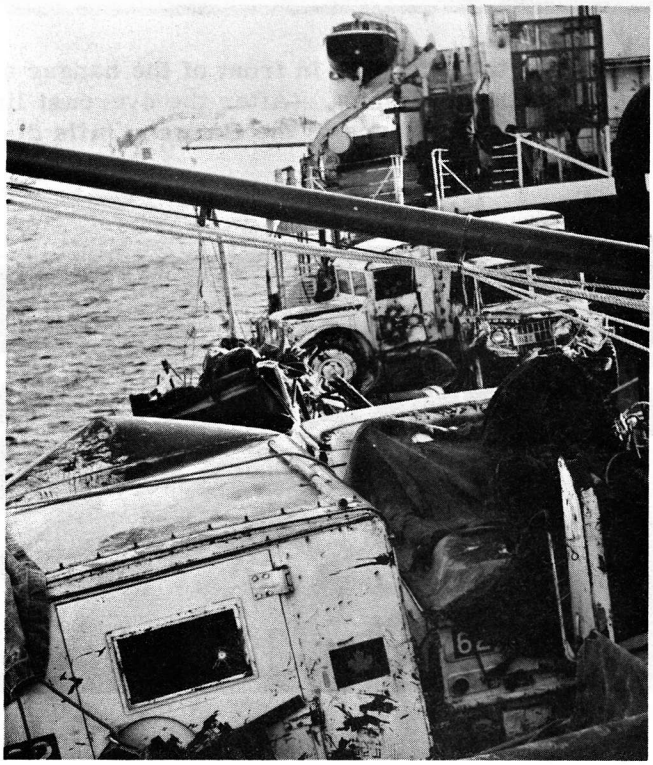
Yesterday morning I went with Major Harrison to meet HMCS Provider at Sorreisa, and to take a look at the vehicles and aircraft on board. Made a 'first' by climbing aboard by rope ladder from a landing craft. The damage done by the heavy seas is 'fantastic': snowplow blades twisted like pretzels; 3/4 ton trucks flattened to the chassis.

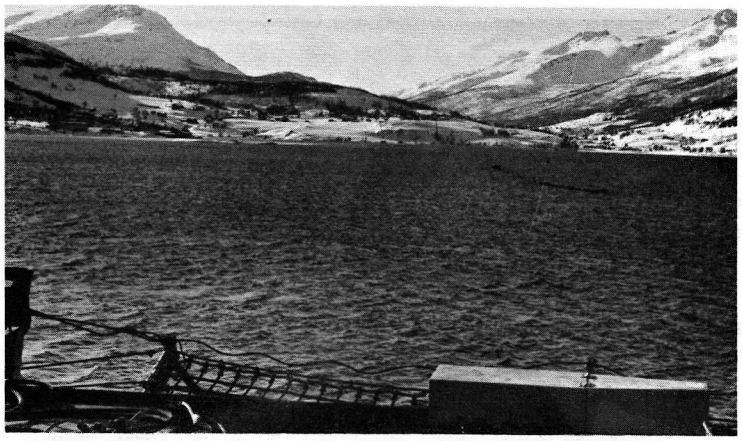
The three Vertols came through undamaged. I probed around all over the ships and did not find one trace of salt damage. However, 412 on start-up had compression stall around 65 per cent with high temperature rise. A check of the engine showed foreign object damage. WO2 Trattles and his men arrived yesterday. Ssgt Clarke, resident on board, had his hands full during the voyage;

(Author's photos except the first,

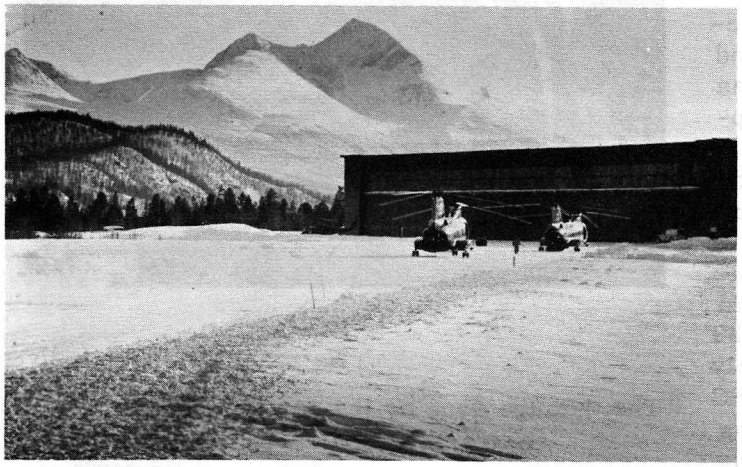
National Defence photo

"The damage done by the sea is 'fantastic'..."





View from HMCS Provider anchored off Sorreisa



Two Vertols standing in front of the hangar and (below) the tent lines. (After the overcast lifted, the resemblence to the Gatineau hills disappeared.)

vehicles parked close to the a/c started to move and threatened to damage them. The staff made chalk marks around all the wheels and had a 24-hour guard on to check for slippage.

Damage to the aft rotor head of the a/c was narrowly averted when they were loading the a/c into the hangar. Here's the story. When overhead clearance of the doors was first checked there were no problems; however, a 4-inch water dam was added about 6 feet ahead of the doors, which lifted the a/c up just as the rotor head was under the lowest part of the door. The oleos were let down to about an inch, and all was well.

Last night I was thankful to have been the guest of the coxswain, and slept the night in air-conditioned comfort. In the tents I find the worst part is getting up in the morning and trying to light the stove to make breakfast.

(Since starting this note I've had many interruptions including a break for the usual 2 1/2 oz rum issue. I'm not complaining.)

The exercise gets underway today, so by tomorrow I can start computing workhours, etc. Capt RB Manning, Maintenance Officer, has been delayed for a few days and will not be here until the 12th.

8 Mar

The daily routine is beginning to shape up, along with the usual complaints. I am enclosing a copy of routine instructions; the shift work system is working well, and is rotated daily, so that the first shift finishes sometime during the afternoon and starts again at 1 o'clock the next day. The co-operation between pilots and maintenance is very good.

I should explain at this time that a section of a larger hangar, close to the detachment lines, was made available. This has made working conditions excellent. Also all the spare parts are inside out of the cold. In all the planning I fail to see how they could have operated without this hangar; the 14x14 foot tent would have been the HQ and the telecom tents used for stores, but the working conditions would have been awkward.

I have been informed by Sgt Hoyt (Telecom), that the Norwegians have the same equipment as we do, but that no spares are available.

It should be considered that three men is a crowd in a 5-man tent, what with barrack boxes, kit bag, flying clothes, personal suitcases, etc, there's not much room left for cooking. And that last condition is debatable; most lads consider that with the staggered hours of eating, they prefer the combat ration.

Because this is time-consuming, other lads

would like to see meals prepared by a cook at set times.

The Russians can be thanked for one thing. Radio Moscow comes in clear and has programs in English, including the Beatles.

I met Sgt Ted Cook, RCEME unit armourer with the Black Watch, who made the following observations.

The Soldering and Brazing Set, C2, has been frozen for 4 days now. He has heated up the regulator but can get only a low pressure flame, hardly enough to light up. It gives all the indications of the low temperature freezing the regulator. He suggested an insulated blanket for the bottle and a separate insulated box for the regulator. Also the guage supplied indicates tank full or empty only, although there is space on the regulator for a guage (say 0 to 50lb) which would be an asset.

Before this exercise he was asked to scale his requirements for a 30-day operation, but this was not accepted. So, being a good soldier, his only source of spares is his own personal box ot tricks.

Sgt Cook has assumed a full-time job for the battalion on their stoves and lamp repairs. I did not ask him where he got his parts from, as he fixed my lantern after it had failed to work at Gagetown last year, and couldn't be fixed by the detachment.

Transportation to sites is a problem for him, too, as he has no vehicle, and depends upon anything going in the general direction that he wants to go. Are we that short of jeeps?

A larger tool box would be welcomed, as his is overflowing with special guages, etc. Also he would like a set of taps and dies; many times he has used extractors and would like to clean up the threads before replacing the screws.

Finally, the Black Watch have built him a workbench with lots of drawer space. Without it I can't see how he would do his job. This should be authorized.

He sends his best regards and hopes to see some improvement in his empire.

Major CH Reid, CO 1 Tpt Hel Pl, would like to add that on an exercise of this kind, the requirments for vehicles should be the responsibility of the unit; it should not be told what it will take.

Weather today: light snow, temp 25F.

The a/c sit out all night; the temperature has dropped to -25 degrees F but have had no trouble starting the engines.

It's time for me to get back out into the cold, and see what's up.

Frank

King Olav 5 of Norway (center right with back to camera) preparing to board Canadian Army helicopter. Major Reid and Capt F Wagner, pilot, awaiting the King's arrival on the a/c.

Troops boarding 412.

The jeeps "...remind me of SPARTON...it could well be 1943..."

FUN WITH SQUARES

1. The square has probably entertained and provoked man more than any other geometric figure in history. It is appropriate, then, to begin with a problem involving the chessboard, the pinnacle of man's success in as much as applications and recreations of the square are concerned. If two squares are removed from opposite corners of a chessboard leaving 62 squares, can the chessboard be completely covered with 31 dominoes? Each dominoe is just large enough to cover two squares on the chessboard.

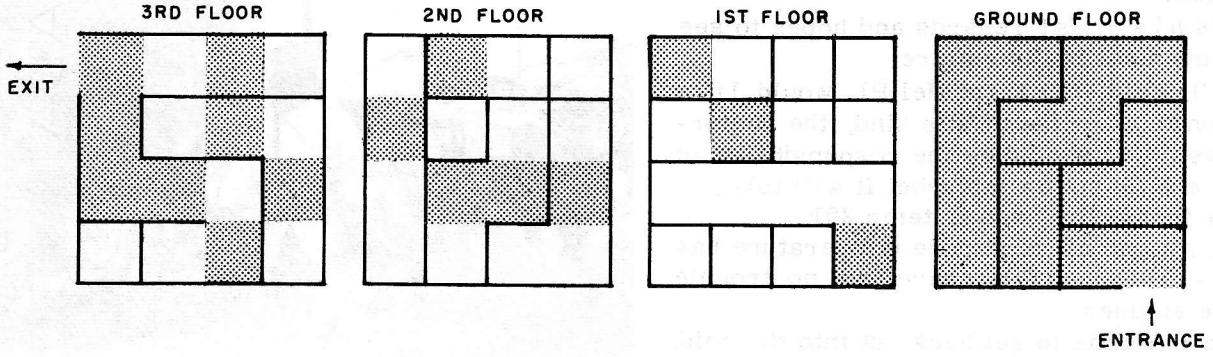
2. The cube is a familiar three dimensional geometric object that is formed by squares. A mathematician intrigued by cubes noticed that his son had blocks of two sizes among his toys. On observing the blocks more closely he discovered that the combined volume of two blocks (one of each size) equalled numerically the combined length of the sides of the two blocks. If the lengths of the sides of both blocks are whole numbers what are the dimensions of the two blocks.

3. A more challenging problem involves visualizing the movement of a marble through a three dimensional cubic maze from the floor plans of the maze. This problem involves a four-by-four-by-four cubic maze. Essentially it is a cube of transparent plastic divided by transparent partitions into 64 smaller cubes. By eliminating various sides of the small cubical cells one can create a path through which a marble can roll. On each of the four levels shown below, the solid lines represent side walls, shadow indicates a floor; no shadow, no floor. Thus a small square cell surrounded on all sides by black lines and unshadowed is a cubical compartment closed on four sides but open at the bottom. To determine if it is open or closed at the top it is necessary to check the corresponding cell on the next level above. The top level (3rd floor) is of course completely covered by ceiling. See if you can visualize the shortest path from entrance to exit using only the floor plans.

4. Here is an easy one that is concerned with yet another kind of square. The integers 1, 3, 8, N have the property that the product of any two when added to unity yields a square. What is N?

5. Imagine you have an unlimited supply of rods all the same length. They can be connected only at their ends. A triangle formed by joining three rods will be rigid but a four rod square will not; it is easily distorted into other shapes without bending or breaking a rod or detaching the ends. See if you can find a way to add rods to the square, joining them only at the ends, so the square is made rigid. Note, all rods must lie in the plane of the square.

Answers in July issue.
Send all inquiries to
Lt R E Betzner
165 Lincoln Park
Calgary Alta



A REAL PRIZE FOR THE RCEME MUSEUM

By Cpl Bill Baird

Just before the Korean cease-fire in 1953, Cpl Earl Hodge, then of 23 Infantry Workshop RCEME, was inspired to paint a scene which came to his attention many times a day. The Workshop at that time was located at Parane, 15 miles north of Tokjong, Korea. They were billeted on the edge of a hill facing many rice paddies.

The Korean "Papa-sans" used to come down the paddy paths on their way to the village, bearing enormous loads of wood, grain and other materials. These small sturdy people carried these loads on what we call an "A" frame. They also carried a forked stick which was used as a walking stick and a means of support for the "A" frame when the papa-san rested. Apparently these people carried items as heavy as fully crated jeep rear axle assemblies for the RCOC depot in Seoul.

Inspired by these facts, Earl scrounged a piece of canvas (of the type used in vehicle tarps), some automotive enamels and produced the 25 by 31 inch painting which he called the "Korean Woodcutter".

After the workshop left Korea, it was somehow mislaid. It was discovered in 1959, in a tool box on issue to 2 Field Workshop located at Camp Petawawa. On discovery the painting was framed and hung in the workshop Commanding Officer's office until 1965. Realizing the historic value to RCEME, Major RL MacIntosh CD (CO 2 Fd Wksp RCEME), had the painting sent to the RCEME School for presentation to the corps museum.

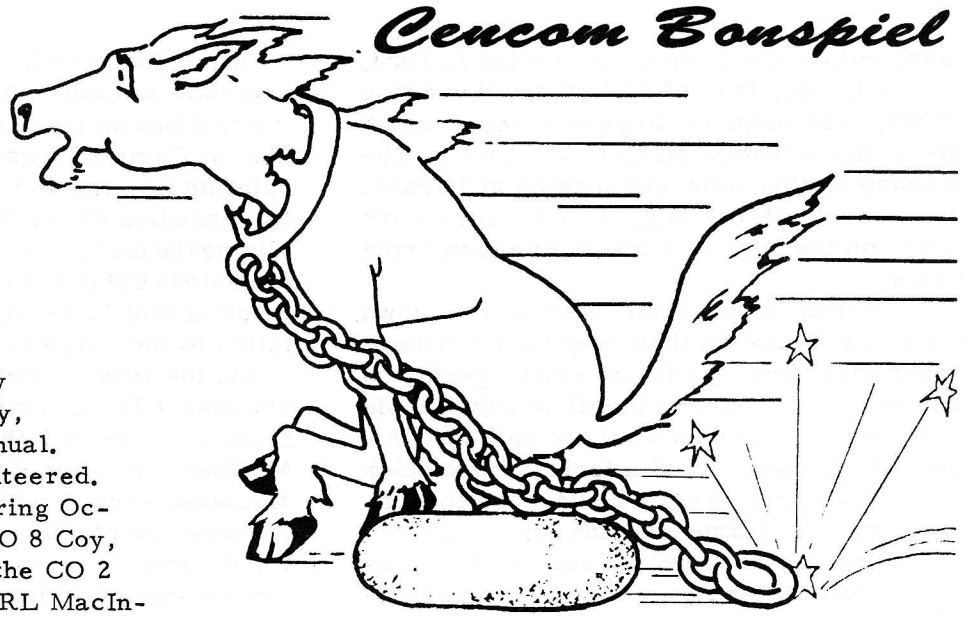
On the 16th of February 1966, Colonel AL Maclean CD, Commandant of the RCEME School, presented the painting to Cpl Frank MacIsaac, curator of the RCEME museum. Cpl MacIsaac served with Earl Hodge in Korea at the time the painting was done. The "Korean Woodcutter" has now taken its place with the other historic momentos of the Corps of Royal Canadian Electrical and Mechanical Engineers.

Cpl Earl Hodge as well as being a very talented artist and cartoonist is a group three vehicle mechanic employed by 4 Field Workshop RCEME in Soest, Germany.

Cpl MacIsaac and Col Maclean admire the "Korean Woodcutter — Bill Baird photograph

Third Annual R.C.E.M.E. Cencom Bonspiel

By
Capt RMG MacKenzie
CD



It was decided during the Second Annual Bonspiel in Camp Borden, Jan 65, that Camp Petawawa, namely Major BB Cox, CO 8 Coy, would host the Third Annual. In fact, Major Cox volunteered.

Planning started during October with the current CO 8 Coy, Major CR Morgan, and the CO 2 Field Workshop, Major RL MacIntosh, appointing Capt RMG MacKenzie to be chairman of the event.

Lt Col NW Reilander, CD, Commander Camp Petawawa, threw the first stone at 1030 hours on Friday, the opening day of the bonspiel. He threw to the broom of Lt Col Max Robinson CD Command EME Cencom, with the COs of the two Petawawa units sweeping.

Lt Col Reilander

Arrangements were made with 2 CIB sergeants' mess to provide meals more or less on demand, at a nominal price. They did an excellent job. Brunch was served daily and supper hours were an extended affair so that no one who really wanted a hot meal was left hungry. No meal was provided for the Thursday night arrivals, nor were meals available late at night. (This should be changed next year -- a hungry RCEME type is difficult to deal with.)

No specific planning was done on social activities except for a buffet supper on the Saturday night. It was an excellent meal. It is recommended that a banquet style reception be held or at least hold the buffet away from the curling clubhouse.

It is quite an event to gather together 32 rinks, with all the people involved, from as far away as Oakville and Borden. But curlers make it simple by entertaining themselves: provide a bed, some ice to curl on, a bar, some food, aspirins, and cordiality, and the event is a success. As Camp Petawawa did all these things, the Third Annual RCEME Bonspiel must have been a success.

All participating skips, and others, are invited to comment on the 1966 spiel; send your remarks to 14 Coy, Camp Borden, in anticipation that they will be hosts next year.

WINNERS
Rider, Chalmers, Freeman, McElroy

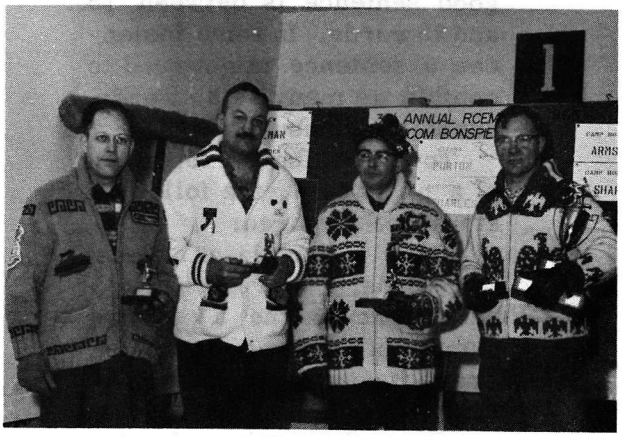
BLUE EVENT

RUNNERS-UP
Crowford, Barnaby, Diebert, Vieweg

WINNERS
Haggins, Boon, Groom, Purton

GOLD EVENT

RUNNERS-UP
Orme, Turcotte, Campbell, Charles



WINNERS
Drummond, Quick, LaFrance, Sales

RED EVENT

RUNNERS-UP
Watson, Patterson, Richardson, Sharpe

LETTERS

Sir:

Reference the article "2208, What's That?". It has been noted that one of the headings as printed in Figure 2 is wrong.

Instead of "CONDITION OIL", the column should read "CONDITION CL" meaning "condition classification".

DB Perrin

Sorry. One of those things that just happen.

Sir:

Enclosed is an article based on "The Fog Index" in the October 63 Bulletin.

I was converted to the Fog system by ALCAN, where I worked from 1960 to 1963. The Technical Department (Kingston Works) used to apply it to all reports and longer letters produced for both internal and external dissemination.

Since joining the army I have often wished that more people applied the Index to their writing. Many CFHQ letters and messages, including some from DEME, are unbelievably foggy. I think "The Fog Index" should be required reading for all officers. Maybe you should forward a copy to the "Sentinel", along with "Duck the Fog".

By the way -- this letter has a Fog Index of eight.

JI Hanson Lt

Thank you for your letter and "Duck the Fog". The excerpt from our Oct 63 story on this page will serve to introduce your story beginning on the next page.

Your use of familiar pamphlets to illustrate the fogginess that we are all exposed to, will - perhaps 'may' is a better word - encourage our writers to produce more readable writing.

(Compare, if you will, the fog in "Workshop Accounting Procedures" page 9.)

THE 'FOG INDEX'

The index is based upon counts of long words and of sentence length. It includes a factor to make it represent the approximate number of years schooling that are required to understand the written passage. Thus, the higher the fog index, the harder the writing is to read.

To determine where sentences may be too long or where big words may be unnecessary, the fog index may be applied to eliminate some of the fog.

The average length of a good sentence is between 15 and 25 words. In some instances a sentence might need to contain as many as 35 words, but this is unusual.

To determine the fog index of a passage, the following steps are required:

a. Take a sample of at least 100 words.

b. Determine the average number of words per sentence. Treat independent clauses as sentences.

c. Count the number of polysyllables (words of three syllables or more) per 100 words. Omit from the count:-

d. Capitalized words.

e. Combinations of short easy words such as manpower and insofar.

f. Verbs made into three syllables by adding -es and -ed.

Add the number of words per sentence to the polysyllable count and multiply the sum by 0.4. Ignore digits after the decimal point.

Because few readers have more than 17 years of schooling, any passage that tests higher than 17 is assigned a fog index of 17.

DUCK THE FOG

By Lieut JI Hanson

The October 1963 RCEME Technical Bulletin featured a very good piece on writing. It was titled "The Fog Index". A few people read this article. Many, it would seem, did not. Few Army people outside RCEME read it, and those that did are not in evidence. Read the article yourself. It will help your writing style.

It is interesting to note that several civilian companies have not only heard of the Fog Index (or Fog Factor as it is sometimes called), but also insist on its application as an acceptability criterion to simplify all forms of reports and memoranda produced by their employees for both internal and external dissemination. Large industrial firms generally place financial considerations before all others. Their conviction is that use of the Fog Index assists immeasurably in the rapid digestion and comprehension of masses of material from written correspondence, saving valuable time for their executives, hence money for their business.

(The first paragraph in this article has a Fog Index of about four. The second paragraph is six times foggier, with an Index in the region of twenty-four. While these examples go to extremes, they do point up the fact that a high Fog Index indicates low readability, and vice versa. It should be understood that the Index has nothing to do with reader interest. Many people might find the second paragraph more interesting than the first. They certainly won't find it more readable.)

While the Fog Index is not an end-all for writing ills, it does have one important application. It permits you to aim your writing at your reader. The Fog Index of a passage roughly equals the number of years' schooling required to easily understand that passage. The Army officer should have no problem with any passage having a Fog Index of 12 or less. The other rank, however, may well be over his head above the ten level. Hence whenever you write something that requires action or clear comprehension on your reader's part, remember this fact and write accordingly.

To see if the Army as a whole writes for its readers' capabilities, a number of Army publications were tested for Fog level. A sample, or several samples, each of at least 200 words, was taken from each book for testing purposes. In every case the sample came, where possible, from sections where the book was trying to "sell" some point, hence where clarity was essential. The results looked like this:

Book			Fog Index
CAMT	1-36 Vol 3	Staff Duties	12
"	1-34	Org & Adm - CDA	17
"	2-57	Security	13
"	3-13	Armour	12
"	4-1-1	Artillery	10
"	5-1	Engineers	14
"	6-15	Signals	11
"	7-84	Infantry	13
"	11-3	RCEME	12
EME Manual Veh Section A			13-15

Since most pamphlets are used for NCO as well as officer training, they should rarely exceed a fog index of ten, and eight would be preferable. The EME Manual tested is a tradesman's book and should never test over eight, and six would be ideal. As you can see, only one of the above group met basic standards (the low index for 4-1-1 is not to be construed as a slur on the intelligence of the gunners).

Try the Fog Index on some of your own writing right now. You'll be surprised at what you find. Next go through your written passage and strike our such "jargonese" words as "applicable", "self-explanatory", "promulgate", and other examples of verbal garbage that so often appear in Army writing. Then try inserting a few more periods in each paragraph. You will find that at first it takes a fair bit of practice and editing to get down to the eight-to-ten level which should be the ideal for general military writing. Once you reach this level though, you'll find it requires little extra effort to remain there.

After you've tried the Fog Index on your own writing, try it on some of the stuff you read every day. The average paperback novel runs around five or less, but the typical CAO or CFAO runs a shade higher. Some letters from "the higher headquarters" are almost incredibly

(Continued on page 38)

RCAF OFFICERS INSPECT PARADE

WO1 AL Hartley, Wing Commander Virr, and Major Ramsey swap a service yarn.

Wing Commander Virr and Squadron Leader AL Turner, left, Virr's successor, are given details of the new mobile workshop vehicle by Lt RG McKenna.

Sudbury Star photos

The officers and men of 33rd Tech Squadron and the Air Cadets of Sudbury honored Wing Commander LG Virr, OC RCAF Station, Falconbridge, prior to his retirement April 12.

The evening commenced with a dinner at the Caswell Motor Hotel, attended by officers and former officers, and all serving NCOs of the Squadron; officers of the Air Cadets; and a number of leading citizens of Sudbury. The guest of honour was introduced by Major Les Ramsey, CO 33rd Tech Squadron.

After dinner the party moved to the new armoury where the new militia headquarters was inspected.

Three flights of Air Cadets and three companies of RCEME were on parade, and were inspected by the wing commander.

During the inspection the Hudson's Bay Sharpshooter's Shield for the top rifleman in the Squadron was presented to Cpl R Staskus by Capt G DesGroseilliers.

Next on the program was the inspection of RCEME vehicles. Included was the new mobile workshop "which opens up and contains all the equipment to be found in an army base garage". There was also a new recovery vehicle and the squadron's new motorcycle.

Presentations from both the Air Cadets and 33rd Tech Squadron were made to W/C Virr.

DUCK THE FOG continued from previous page

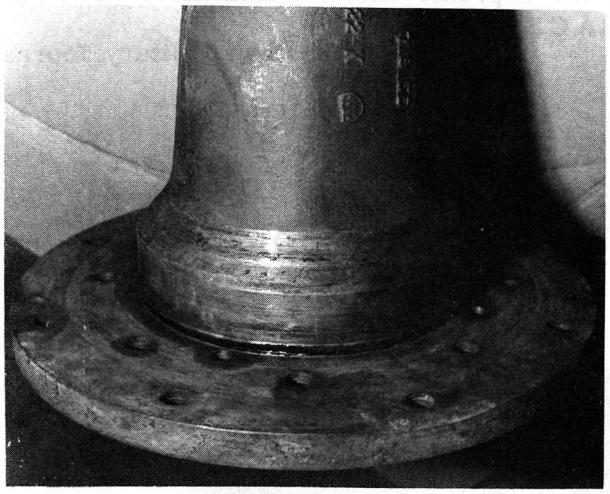
high. Is this the result of staff training, or is some other factor at work? Anyway, once you test a few of these things, you might well become a convert to the Fog Index system. Once convinced, to paraphrase the well known soap ad, "you'll be glad you use the Fog Index. Don't you wish everybody did?" (Incidentally, ignoring paragraphs one and two, the above has a Fog Index of nine. With these paragraphs included, it jumps way up to ten).

Truck, Wrecker, 5 Ton, 6X6, W/Winch
M62 and M543
Crane and Pivot Post Support

Failures have been reported of the Wrecker pivot post support (part 2590-00-970-1202) cracking approximately 290 degrees round the circumference of the casting at the base where flange and cone casting meet.

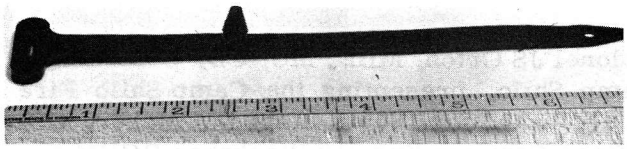
One reason for this type of failure is the overloading of the boom. Another and most important reason is that the shipper braces (boom supports) are supposed to be in the DOWN position and secured to the floor boards. These support the weight of the shipper and boom and relieve the pivot post of this load while travelling.

All wrecker drivers should be alerted to read Change 3, page 2 to TM9-2320-211-10 and amend their Operator's Manual.



TRUCK, DODGE, 3/4 Ton
Spark Plug Cable Clamp

A plastic clamp under GM Part No. 3816659 is available from the automotive trade and may be used to replace Part No. 5340-00-737-3694 Clamp, loop, st, cad, w/cushion, 1 1/8 inch to 1 3/8-inch loop by 1/2 inch wide, which is used to hold spark plug cables.



LSGT E.M. PERROW EARNS "GOOD SHOW" AWARD

A CH113A at CJATC Rivers was known to have an oil leak from the vicinity of the aft transmission. Although the source of the leak was not known, the quantity of oil lost in a flight was not excessive and the helicopter was still considered serviceable. This area of CH-113A's does occasionally have leaks from poor shaft seals or loose couplings but these all appeared sound on this machine. When the leak was discovered it had been known to exist for 40 airframe hours.

Lsgt Perrow had checked the helicopter to try to find the leak; he ensured all lines were secure, dried the surfaces off that were covered with oil and applied a dye penetrant developer. During the next flight a large area of the developer washed off. In this area, on very close examination, a fine pencil line could be seen on the transmission casing. The paint was scraped away and the area coated once more in dye penetrant developer. This time the line showed up as a crack in the casing extending across one of the webs.

Lsgt Perrow had checked the transmission on a ground run before the last flight and although nothing showed then, and although the loss was only 1 pint in 1 1/2 hours, he continued checking and found the crack. This was a very hard-to-find crack in an area where none could logically be expected, but which if it continued, could have broken in flight and seized the aft transmission.

A "Good Show" to this technician for alertness, technical competence and perseverence in finding this unserviceability.

THE SECOND STAGE OF INTEGRATION

Where there were 11 major commands in Canada, there are now six: Mobile Command, Maritime Command, Air Defence Command, Air Transport Command, Training Command and Materiel Command.

The 4th Canadian Infantry Brigade Group and No. 1 Air Division, which form Canada's contribution to NATO Europe, will continue to report direct to Canadian Forces Headquarters, because of the nature of their roles.

Administration of the Militia, aid to the civil power, civil survival and provincial representation will be provided by small regional offices reporting direct to Canadian Forces Headquarters.

Largest of the new functional commands will be Mobile Command.

This command will be composed of the 1st and 3rd Canadian Infantry Brigade Groups, the Special Service Force and tactical air units.

The role of Mobile Command will be to maintain combat-ready land and tactical air forces capable of rapid deployment in circumstances ranging from service in the European theatre to United Nations and other peace-keeping operations.

Maritime Command, will consist of sea and air maritime forces on the Atlantic and Pacific coasts. Its primary responsibility will continue to be anti-submarine operations with added versatility that will include the provision of lea-lift in support of Mobile Command.

Air Defence Command's role will be to provide, as it has in the past, the combat-ready air defence forces required to meet Canada's NORAD commitments.

Upon Air Transport Command will fall the task of providing the strategic airlift of men and materiel necessary to give the forces the mobility required by their prescribed roles.

Training Command will be responsible for conducting a personnel selection and classification system, and for providing individual training at the basic, elementary and advanced levels.

Materiel Command will provide the logistics back-up for the forces. It will be responsible for materiel procurement, warehousing, distribution and major repair and overhaul.

The three operational Commands, Mobile, Maritime, and Air Defence — and the Brigade and Air Division in Europe — will be responsible, as part of their functions, for the operational training of assigned forces and the operation of immediate support services which are attached to them.

The framework for Canada's Armed Forces as laid down in the White Paper began to be firmly fleshed out when the Minister of National Defence announced on 17 November 1964, that the 1st Battalion of the Black Watch (Royal Highland Regiment) of Canada would become a part of NATO's Mobile Reserve under the direction of the Supreme Allied Commander Europe (SACEUR).

—Canadian Military Journal

212 WORKSHOP EARNS SHILO SAFETY AWARD

Colonel JS Orton, MBE, MC, CD, Commander Camp Shilo, presenting the Camp Shilo Fire Safety Award for 1965 to Capt DM Maher, CD, Officer Commanding 212 Workshop RCEME.

TANZANIA

By Major DH Fraser, CD

The Canadian Armed Forces Advisory and Training Team Tanzania (CAFATTT) includes the following RCEME personnel:-

Maj DH Fraser	-	Logistics Adviser
Capt RW Miller	-	OC Vehicle and Technician Training Coy
Sgt RE Willard	-	Instructor
Sgt CA Flesch	-	Instructor

At present, the advisory staff is on a two year accompanied posting with the training members including the RCAF team doing a one year unaccompanied tour.

Logistic planning is carried out at Tanzania Peoples' Defence Forces (TPDF) headquarters with training being conducted at the Academy located approximately nine miles from the capital.

The United Republic of Tanzania (which comprises Tanganyika and the island of Zanzibar), Kenya, and Uganda are referred to as the countries of East Africa. The capital and largest city in Tanzania is the seaport of Dar es Salaam, the "Haven of Peace" in translation. The population of the city is approximately 200,000, mostly Africans, with some Asians. The number of Europeans is relatively small.

In a picturesque setting surrounding a natural harbour, it is a city of contrasts ranging from ultra-modern hotels and office buildings to the colourful market area, bazaars, and mud and wattle huts. Most residents of the main residential area are within easy walking distance of a beautiful, palm-fringed sandy beach where goggling is a favourite activity. Excellent facilities exist for sailing, game fishing, golf, tennis, etc, and national parks with their great variety and abundance of wildlife attract many visitors.

Climatic conditions in Dar es Salaam are governed by the monsoons. The south-east monsoon blows from the end of March to mid-October, and the north-west monsoon, which is less strong, blows from November to the beginning of March. This leads to two well-defined rainy seasons locally called the "long rains" and "short rains". Since the city is at sea level the weather remains very hot and humid most of the year.

The army logistics advisory group consisting of a Lt Col (RCASC), Maj (RCEME) are based at HQ TPDF as mentioned earlier. Lt Col JR Rozee, Maj SAM Chalu and yours truly are the present incumbents. Duties are interesting and varied and cover the full scope of AQ functions. A sample of activities to date include preparation of Force organization charts, implementing a system of regulations, orders and instructions, preparation of station development plans, planning and procurement of stores and equipment, preparation of a transport manual including repair and maintenance procedures), unit accounting instructions, ammunition instructions, preparation of scales for stores, tools and equipment and rations, procedures for spare parts accounting and control, form design and control, terms of service, lecturing, etc. It is a most interesting experience helping to develop a military force. We are receiving the utmost co-operation and the Tanzanians are genuinely appreciative of the CAFATTT assistance.

The Tanzania Military Academy is temporarily located near Dar es Salaam. Its permanent location will be at Arusha, 300 miles inland to the northwest. Capt Miller, Sgt Willard and Sgt Flesch, with Tanzanian NCOs, conduct courses in the Vehicle and Technical Training

Coy which is part of the Technical Training Wing. Vehicle and Technician Coy includes a Vehicle Training Platoon (sub-divided into a Vehicle Technician Section and a Driver Mechanical Transport Section) and a Technical Training platoon (Weapons Technician, Metal Technician, etc,). The 1966 course program for V and T Trg Coy includes Driver Mechanic (basic), Driver Mechanic (intermediate) and Vehicle Technician (basic) courses.

This heavy schedule keeps the training staff busy and is complicated by the fact that vehicles differ in manufacture from Canadian Forces models. Also, as yet, we do not have the type and range of training aids, tools and test equipment, etc, normally found at RCEME School. Improvising is the keynote and a great deal has been accomplished in a relatively short time.

This very brief outline of RCEME activity in Tanzania may serve as an introduction to the reader concerning the military assistance program being undertaken by the Canadian Goverment in this most fascinating and interesting country.

Sgt Flesch and pupil checking a Land Rover

(l to r) Ssgt Willard, Capt Miller, Maj Fraser Sgt Flesch. Note Bedford trucks.

Profile of a C.E.T.T.

A year has rolled by since the Certification Board replaced the four-grade system of certification with a program based on these distinct areas of technical education and experience– Engineering Technician, Senior Engineering Technician, and Engineering Technologist. One of the reasons for the change in our belief that we can identify three distinct types of technical personnel in the total engineering spectrum between the skilled craftsman and the professional engineer. During the past year, the Certification Board has been developing 'profiles' of these three types of CETs.

We are aware that a description of a 'typical' engineering technologist or an 'average' senior engineering technician will not accurately describe all individuals. If, however, we can show personnel managers just what each type of CET looks like, what type of work he can do, what sort of experience he is likely to have had, etc, we feel that there is a much better chance of eventually assuring that members of OACETT will be able to gravitate to the types of technical positions for which they are best suited.

Since a research scientist requires more formal education than a professional engineer, an engineer more than an engineering technologist, a technologist more than a senior engineering technician, and so on, this has become the custom to think of the total engineering spectrum as a vertical totem pole divided into levels. It is quite reasonable that the starting salaries for young people leaving the educational ladder and entering industry should reflect that cost of obtaining a certain level of education. However, we would also expect that the 'average' senior engineering technician would have considerably more technical experience than the 'average' engineering technologist who, most likely, graduated from an Institute of Technology within the past few years. Therefore, it is desirable to chop down the totem pole and lay it in a horizontal position so that we can consider the contributions made by the various members of an 'engineering team'.

Let's look first at our impression of a 'typical' engineering technician. We would expect a maintenance technician to know the "how-it-works" of the apparatus for which he is responsible. We would also expect that he would have a natural aptitude for systematically locating faults and doing something about them. However, to qualify as a member of an engineering team an engineering technician must have a sound understanding of the fundamentals of engineering as related to his branch of the engineering spectrum, so that he will be sure that the data he is presenting to his engineering team is accurate so that he will know when to suspect an error and what to do about it. In present-day technology, this required some degree of engineering–oriented post–secondary technical education. For example, a draftsman with a high school graduation diploma in drafting could function quite well in a drafting office as a detailer. But, to do a competent job as a design draftsman, which would qualify him for recognition as an engineering technician, he would be expected to advance his technical education by further technical studies such as the Advanced Technical Evening Class program. (ATEC)

In the future, an increasing number of Engineering Technicians will gain their post-secondary technical education in the technician courses in Ontario Vocational Centres. Still more will gravitate from maintenance technician work by studying engineering fundamentals through the ATEC program. Others will come from England or Europe after obtaining the necessary technical background through Ordinary National Certificate or equivalent courses. And a few young people will be able to rapidly adjust to the work of an engineering technician by virtue of a good standing in senior matriculation, physics, chemistry, mathematics and English.

An important part of the engineering technician's technical education is the laboratory time spent in becoming thoroughly familiar with the sophisticated technical apparatus associate with his branch of the engineering spectrum. In this area if his technical education, proper

* Certified Engineering Technician/Technologist

experience in industry can greatly extend his technical knowledge. This is taken into account in awarding ATEC certificates for primarily class-room studies. We would expect the engineering technician to be much more at home with technical equipment than either the engineering technologist or the professional engineer.

The senior engineering technician's career will probably develop along one of two fairly distinct paths. He may become increasingly involved in the highly-specialized technical apparatus of his branch of technology, thus becoming a recognized expert in some particular area of the applied technology spectrum. Or he may find that his talents develop along a more administrative line so that he becomes a supervisor of engineering technicians and other technical manpower.

As already noted, an engineering technologist does not need to be as thoroughly at home with the 'hardware' of his technical specialty as does an engineering technician. Hence, it follows that a person cannot move from an engineering technician position to a technologist position on the basis of experience alone. Those technicians who do choose to make this shift will accomplish it through their desire to pursue more advanced technical education through either full-time or part-time attendance in Institute of Technology level courses (such as the third ATEC certificate).

The present-day engineering technologist does the work which, a generation ago, was done by the applications engineer. The rapid advance of technology has required the professional engineer to move from applied engineering into applied science. This shift has required the engineer's formal education to place more emphasis on abstract mathematical reasoning. This in turn is likely to limit his adaptability to the more practical aspect of applying proven engineering projects. Thus, in the last decade or two a new breed of engineering personnel which we call the "engineering technologist" has appeared on the scene. As industry recognizes the type of work that an engineering technologist is capable of performing, more and more of the applications engineering assignments are now being very efficiently handled by engineering technologists. Although a number of engineering technologists will continue to migrate from the ranks of senior engineering technicians who pursue their continuing education to the technological level, the majority of engineering technologists will graduate from the engineering technology programs of Institutes of Technology and equivalent institutions in other countries.

I don't know whether you will be able to distinguish an engineering technician from an engineering technologist on the basis of these sketchy profiles if you happen to run across one in the local tavern. However, the important thing is that both the technician and the technologist are members of OACETT and work together in the interest of all members of the Association.

We would expect that an engineering technician would be given a technical assignment with fairly specific terms of reference. He would then have the alility, knowledge and experience to carry out the assignment with a minimum of supervision. He would also be able to recognize problems which require the attention of someone with more knowledge and experience than himself and would know how to communicate these problems to the right people. He must also be able to report his findings in a form that can be readily understood without error by other members of the engineering team.

We would expect the 'average' senior engineering technician to be senior in both technical maturity and experience. In general, we do not see a full-time day school program turning young people in their early twenties loose with qualifications which would classify them as senior engineering technicians. In modern technology continuing education is essential. Hence, we would expect that engineering technicians by combining further technical studies at the second certificate ATEC level, or at the UK Higher National certificate level, with the experience they gain on the job.

By HW Jackson, P Eng,
Chairman,
Certification Board, in
"The Ontario Technologist"

who's where

LOCATION OF RCEME STAFF SERGEANTS

Alexander	RJ	EBS Bn
Allen	FT	HQ BC Area
Allen	T	13 Coy
Anderson	DE	ME
Anderson	GA	1 Fd Wksp
Anglin	P	202 Base Wksp
Anyan	SG	2 Coy
Armour	GD	2 SSM Bty
Arnott	DA	10 Coy
Arsenault	JMC	5 Coy
Arsenault	RP	ME
Atkin	RJ	CJATC
Atkins	JW	4 Fd Wksp
Annas	OE	CJATC
Aubuchon	R	HQ CBUE
Bailey	L	4 Coy
Baillargeon	H	5 Coy
Barber	TW	4 RCHA
Barker	AC	56 TPT
Barnes	WG	CJATC
Barnhart	JB	11 Coy
Batty	DJ	6 Coy
Bennett	BW	DEME
Berdan	WE	HQ Alta Area
Best	WA	DEME
Bezanson	RT	7 Coy
Billinghurst	FJ	DEME
Bing	J	2 RCHA
Bingham	HC	13 Coy
Birdsell	DG	4 Fd Wksp
Bishop	JA	EBS Bn
Blanchard	JM	2 Fd Wksp
Blank	EW	1 TPT Hel Pl
Bodine	WC	11 Coy
Borden	FI	CJATC
Bothner	AD	13 Coy
Boudreau	JIF	11 Coy
Boudreau	M	HQ Que Comd
Boutillier	AE	RCEME School
Bowles	JA	202 Base Wksp
Boyce	EF	3 Coy
Boyte	JC	10 Coy
Brimmage	RC	2 Fd Wksp
Broadbent	WH	202 Base Wksp
Browne	WD	AEEE
Burgess	DR	RCEME School
Burleigh	JBM	RCEME School
Burnby	L	13 Coy
Burnet	RL	13 Coy
Cameron	RJ	8 Coy
Campbell	AM	3 RCHA
Campbell	HE	8 Coy
Campbell	MA	HQ CBUE
Cannon	NB	4 Fd Wksp
Carr	AJT	1 Coy
Cederberg	RA	RCEME School
Champagne	JP	5 Coy
Chandler	RL	CADEE
Charbonneau	JJL	HQ Que Comd
Clarey	DJ	RCEME School
Clark	J	202 Base Wksp
Clark	KD	3 RCHA
Clark	WJ	HQ Mobile Comd
Clarke	TJ	1 RCR
Cleveland	HW	3 Coy
Clinton	WFD	1 Fd Wksp
Cochrane	GG	202 Base Wksp
Colborne	EK	RCEME School
Colbridge	DW	Alert
Cole	GN	8 Coy
Cole	JC	14 Coy
Collins	EA	RCEME School
Cooper	KRH	FHG
Cornell	AH	5 Coy
Cote	L	5 Coy
Crane	JA	EASE Sig
Crawford	GHL	5 Coy
Cronin	RM	3 Coy
Crosby	RD	1 TPT
Cruichshank	GJ	202 Base Wksp
Culling	JT	4 Fd
Cushing	JE	27 COD
Darton	FA	27 COD
Davidson	HJ	RCEME School
Davis	JJ	1 RCHA
Daye	RE	1 TPT Hel Pl
Desjardins	JGR	202 Base Wksp
Dewson	JE	4 Fd Wksp
Doerkson	A	2 Coy
Dormer	GH	202 Base Wksp
Doubleday	EG	RCEME School
Downes	JD	HQ Mobile Comd
Ducasse	C	5 Coy
Duffy	RL	UNEF Middle East
Dunham	RD	4 Fd Wksp
Dypolt	EJ	DID

Edwards	GH	LdSH
Eldridge	HE	7 Coy
Embury	RE	1 Fd Wksp
Encarnacion	RH	1 Fd Wksp
Endall	RE	2 RCHA
Fagan	WH	HQ Eastern Ont Area
Farrants	MJ	11 Coy
Faulkner	EM	UNEF Middle East
Finsten	LR	HQ Sask Area
Fletcher	VA	2 Fd Wksp
Forbes	WR	RCEME School
Foreman	M	202 Base Wksp
Foster	JT	10 Coy
Freeman	JI	2 Coy
Frenette	N	3 RCHA
Fuller	AB	CBUE
Funk	P	RCEME School
Gattrell	CA	4 Fd Wksp
Gaudet	NÉ	3 RCHA
Gibbs	E	13 Coy
Gibson	GW	2 Coy
Gibson	RR	CJATC
Gillies	DJ	4 Coy
Glover	W	RCEME School
Goodfellow	JJA	202 Base Wksp
Goodman	EET	DEME
Gordon	FC	RCEME School
Gork	KD	10 Coy
Gourlay	KJ	14 Coy
Green	ER	202 Base Wksp
Gross	EJ	3 Coy
Guillemette	A	10 Coy
Gumbley	HG	FGH
Haas	DF	3 RCHA
Hackett	GK	202 Base Wksp
Hancox	WR	RCD
Harding	WE	RCEME School
Harlow	AL	RCD
Harris	FJ	13 Coy
Hartle	WM	13 Coy
Hawkins	AE	EBS Bn
Heichert	RR	8 CH Recce Sqn
Hein	GR	RCEME School
Hemley	HWE	4 Fd Wksp
Henderson	WR	7 Coy
Hercum	WJ	4 Fd Sqn RCE
Hetherington	LG	RCEME School
Hewitt	JS	13 Coy
Heximer	AM	2 Coy
Hicks	IH	EBS Bn
Hightower	WH	LdSH (RC)
Hill	FW	RCEME School
Holder	AE	4 Fd Wksp
Hoskin	VE	11 Coy
Hudson	PS	RCEME School
Hudson	IF	10 Coy
Hudson	PA	CJATC
Humphries	GD	13 Coy
Hunt	AK	2 Coy
Ion	RJ	EASE
Irvine	HN	13 Coy
Jackson	RWE	Central Ont 'I' Staff
Jahraus	H	1 Fd Wksp
Jermey	FW	RCEME School
Jodain	DJC	6 Coy
Kerr	RG	RCEME School
Kilfoyle	WC	3 Coy
Kimber	JB	AEEE
King	RE	RCEME School
King	WG	8 Coy
Klossen	J	10 Coy
Knight	DF	RCEME School
Knight	JE	CFHQ T/L
Knott	WH	ASE RCE
Koethe	PJ	1 Fd Wksp
Kohler	WJ	3 Coy
Kroecker	IJ	EBS Bn
Kennet	AE	1 CBOU
Lacelle	JAD	HQ E QUE Area
Lafleur	JM	RCSA
Laing	JT	RCEME School supy
Lambert	HJ	RCEME School
Laramie	DA	2R22R
Laruelle	G	202 Base Wksp
Lascelles	JA	ME
Latour	RM	EBS Bn
Lawless	RG	FGH
Leblanc	RJ	25 COD
Ledgerwood	WA	HQ C Ont Area
Leichnitz	DLF	AEEE
Leslie	WG	ME
Linge	HL	1 Fd Wksp
Linzmayer	F	13 Coy
Lloyd	RA	RCEME School
Lockett	AE	1 Fd Wksp
Lovell	AH	LdSH
Lusk	NEP	CADEE
MacDonald	JA	EBS Bn
MacDonald	DWF	1 Fd Wksp
MacDonald	WF	1 Loc Bty
MacKay	AH	2 Coy
MacNeil	ER	7 Coy
MacNeill	WC	1 RCHA
Malmsten	RE	11 Coy
Mansell	GA	202 Base Wksp
Mansfield	LA	13 Coy
Marriott	WG	RCEME School
Martin	GH	13 Coy
Martineau	RVJ	HQ Que Comd
Massey	JL	1 Coy

Masson	PH	AEEE
Mc Alpine	AJ	3 Coy
McClafferty	CE	4 Fd Wksp
McClafferty	LM	RCEME School
McDougall	RM	RCD
McDowell	FJ	4 Fd Wksp
McGrath	HFJ	8 Coy
McIntosh	RC	14 Coy
McKee	AG	6 Coy
McKnight	CWB	10 Coy
McLean	GD	2 Coy
McLeod	AS	2 RCR
McLeod	LW	11 Coy
McPhee	LW	2 Fd Wksp
Meints	RC	3 Fd Sqn RCE
Meisner	GG	RCAC School
Mercer	RL	7 Coy
Meroni	M	RCEME School
Miller	AR	ME
Miller	WPR	11 Coy
Mombourquette	JS	6 Coy
Mooney	CJO	CJATC
Moore	J	2 RCHA
Morden	SD	4 Fd Wksp
Moreau	G	2 RCHA
Munday	KR	CJATC
Murphy	JD	EBS Bn
Myra	EA	6 Coy
Nicol	RJ	202 Base Wksp
Noel	H	DEME
Nolan	AR	1 Fd Wksp
Noonward	DC	202 Base Wksp
Nunn	GJC	3 Coy
O'Neil	JP	3 Coy
Owen	RS	RCEME School
Palmer	MP	1 RCHA
Paradis	LA	EBS BN
Parsons	FG	AEEE
Patrick	KG	ME
Patterson	FA	13 Coy
Payson	GS	4 TPT
Phillips	GL	2 Fd Wksp
Phipps	LW	14 Coy
Pilote	GCR	11 Coy
Pineault	E	5 Coy
Piper	MW	27 COD
Porteous	PR	4 RCHA
Porter	E	CADEE
Powell	ES	27 COD
Preston	WJ	4 Fd Wksp
Putman	WG	11 Coy
Quinn	WR	RCEME School
Raby	KO	AEEE
Randall	DE	27 COD
Regimbal	H	CFHQ
Reid	HC	4 Coy
Reid	JA	1 Fd Wksp
Rice	EA	EBS Bn
Ridlington	AR	5 Coy
Ripley	FA	1 C MED
Robertson	JB	LdSH
Robinson	RN	HQ CBUE
Rogers	CP	6 Coy
Rose	NE	RCD
Ross	DA	4 Fd Wksp
Ross	RC	AEEE
Ross	WC	2 Fd Wksp
Rostek	WF	1 Loc Bty
Rowell	LH	3 Coy
Roy	AJ	27 COD
Sales	RS	2 TPT
Saunders	RB	RCEME School
Saunders	WJ	13 Coy
Schell	SE	4 Fd
Schnarr	AE	3 Coy
Schussler	WD	3 RCHA
Scott	JM	202 Base Wksp
Sears	D	EBS Bn
Serle	JD	1 Loc Bty
Shepherd	KI	RCEME School
Shultz	AD	3 Coy
Sibley	MH	13 Coy
Siefert	JH	2 RCHA
Simpson	FA	2 Fd Wksp
Sitter	MC	13 Coy
Skitteral	WE	1 TPT Hel Pl
Slade	GL	6 Coy
Smith	BW	202 Base Wksp
Smith	DB	14 Coy
Smith	JW	1 PPCLI
Snell	JC	3 Coy
Snider	PL	AEEE
Snyder	WO	EBS Bn
Spragg	WH	7 Coy
Stables	JJ	RCEME School
Steele	PA	FGH
Stevens	DW	4 Fd Wksp
Steward	DF	2 Fd Wksp
Steward	GW	202 Base Wksp
Stewart	A	13 Coy
Stewart	JR	HQ CBUE
Stoney	ME	FGH
Stooke	RG	1 SSM Bty
Stover	RE	RCEME School
Stubbe	W	10 Coy
Sturley	KM	CJATC
Sudds	WA	202 Base Wksp
Sugrue	M	202 Base Wksp
Swann	EL	202 Base Wksp
Swedberg	GO	FGH

Swift	DW	7 Coy
Szekeres	JJ	RCEME School
Taylor	PH	AEEE
Tetlock	LS	2 Fd Wksp
Thibault	CE	RCEME School
Thompson	GF	14 Coy
Thoresen	RE	13 Coy
Thorne	KA	CBUE
Totten	CR	RCD
Townson	CB	10 Coy
Tryon	ER	9 TPT Coy
Turcotte	GJ	RCEME School
Turner	AG	RCEME School
Vipond	CD	CADEE
Wacey	WC	10 Coy
Walker	BG	13 Coy
Walker	LH	4 Fd Wksp
Wardle	JS	2 OOR of C
Watson	MTG	3 Coy
Watson	RK	10 Coy
Waugh	CH	4 Fd Wksp
Weekes	WL	EBS Bn
Westergard	O	1 Fd Wksp
Wheatley	HJ	10 Coy
White	DR	1 RCHA
White	TD	2 Coy
Wight	AH	DEME
Wilkes	RA	10 Coy
Willard	RE	14 Coy
Williams	DB	7 Coy
Williams	W	2 Coy
Willis	RR	ME
Wilson	FL	Pers RCEME
Wiltshire	CAJ	AEEE
Winegarden	GW	RCEME
Wolfenden	R	RCSA
Wright	WF	HQ CBUE
Wright	WH	CADEE
Yorker	KAF	RCEME School
Young	RM	ME
Zdancewicz	EF	RCEME School

INCREASE YOUR MILITARY VOCABULARY WITH A BUZZPHRASE GENERATOR

The buzzphrase generator consists of three columns of words and phrases, numbered 0 to 9. arranged as under:

	Column 1		Column 2		Column 3
0	Integrated	0	Management	0	Options
1	Total	1	Organizational	1	Flexibility
2	Systematized	2	Monitored	2	Capability
3	Parallel	3	Reciprocal	3	Mobility
4	Functional	4	Digital	4	Programming
5	Responsive	5	Logistical	5	Concept
6	Optimal	6	Transitional	6	Time-phase
7	Synchronized	7	Incremental	7	Projection
8	Balanced	8	Third-generation	8	Hardware
9	Compatible	9	Policy	9	Contingencies

There, now. The conversation turns to defense and an opening occurs for you. You have one or two ideas - come now; everybody has one or two ideas about defense, even in the Defense Department - but you do not know how to express them so as to impress your hearers with your grasp of the subject.

What you do, then, is to think of any three-digit number, relate the digits to the words in the three columns, and unostentatiously drop the product into your first sentence. Take 258, for example - systematized logistical hardware.

Everybody who knows anything about defense knows that an ample supply of logistical hardware is one of the prime needs of the day. Obviously, if logistical hardware is to be of any use at all, it must be systematized. So there you are: "It seems to me, if I may say so, that the Defense Department in its current posture is not giving enough attention to systematized logistical hardware." After that, you can say anything; you are a certified expert.

402? Functional management capability. Is anyone against functional management capability in our Defense Department - Communists excepted, of course? 840? Balanced digital options. It may not mean much, but, by George, it has a ring to it, hasn't it?